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Search Results - Record(s) 1 through 10 of 28 returned.☐ 1. Document ID: US 20020123430 A1

L7: Entry 1 of 28

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 2. Document ID: US 20020049140 A1

L7: Entry 2 of 28

File: PGPB

Apr 25, 2002

PGPUB-DOCUMENT-NUMBER: 20020049140

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020049140 A1

TITLE: Solid glyphosate-formulation and manufacturing process

PUBLICATION-DATE: April 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hamroll, Bernd	Magdeburg		DE	
Dittrich, Gunter	Magdeburg		DE	
Muller, Bernd	Magdeburg		DE	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 3. Document ID: US 20010029240 A1

L7: Entry 3 of 28

File: PGPB

Oct 11, 2001

PGPUB-DOCUMENT-NUMBER: 20010029240

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010029240 A1

TITLE: ENHANCER COMPOSITION FOR AGRICULTURAL CHEMICALS AND AGRICULTURAL CHEMICAL COMPOSITION

PUBLICATION-DATE: October 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
HASEBE, KEIKO	WAKAYAMA		JP	
SUZUKI, TADAYUKI	WAKAYAMA		JP	
HIOKI, YUICHI	WAKAYAMA		JP	

US-CL-CURRENT: 504/334; 504/206, 504/358, 504/362, 504/363, 504/364, 504/365

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☒ 4. Document ID: US 6475954 B2

L7: Entry 4 of 28

File: USPT

Nov 5, 2002

US-PAT-NO: 6475954

DOCUMENT-IDENTIFIER: US 6475954 B2

TITLE: Solid glyphosphate-formulation and manufacturing process

DATE-ISSUED: November 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hamroll; Bernd	Magdeburg			DE
Dittrich; Gunter	Magdeburg			DE
Muller; Bernd	Magdeburg			DE

US-CL-CURRENT: 504/206; 504/127

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 5. Document ID: US 6228807 B1

L7: Entry 5 of 28

File: USPT

May 8, 2001

US-PAT-NO: 6228807
DOCUMENT-IDENTIFIER: US 6228807 B1

TITLE: Glyphosate formulations

DATE-ISSUED: May 8, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchikata; Masuo	Ibaraki			JP
Prill; Erhard J.	Kirkwood	MO		
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP
Surgant; John M.	Clayton	MO		
Wright; Daniel R.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/366, 504/367

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw Desc	Image									

☒ 6. Document ID: US 6204223 B1

L7: Entry 6 of 28

File: USPT

Mar 20, 2001

US-PAT-NO: 6204223
DOCUMENT-IDENTIFIER: US 6204223 B1

TITLE: Packaged agrochemical composition

DATE-ISSUED: March 20, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Holmes; Peter	Sheerness			GB
Shaunak; Richa	Kingshill			GB
Landham; Rowena Roshanthi	Tunstall			GB
Sohm; Rupert Heinrich	East Peckham			GB

US-CL-CURRENT: 504/366; 206/524.4, 206/524.7, 252/194, 424/455, 504/206, 504/235,
504/250, 516/107

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw Desc	Image									

☒ 7. Document ID: US 6180566 B1

L7: Entry 7 of 28

File: USPT

Jan 30, 2001

US-PAT-NO: 6180566
DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.1; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KIMC
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☐ 8. Document ID: US 6117819 A

L7: Entry 8 of 28

File: USPT

Sep 12, 2000

US-PAT-NO: 6117819

DOCUMENT-IDENTIFIER: US 6117819 A

TITLE: Herbicide implants for plants

DATE-ISSUED: September 12, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Priesnitz; Uwe	Solingen			DE
Holters; Jurgen	Leverkusen			DE
Penner; Gunther	Neuss			DE
Rehbold; Bodo	Koln			DE
Riebel; Hans-Jochem	Wuppertal			DE

US-CL-CURRENT: 504/206; 504/360

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KIMC
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☐ 9. Document ID: US 6051533 A

L7: Entry 9 of 28

File: USPT

Apr 18, 2000

US-PAT-NO: 6051533

DOCUMENT-IDENTIFIER: US 6051533 A

**** See image for Certificate of Correction ****

TITLE: Formulations having enhanced water dissolution

DATE-ISSUED: April 18, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kajikawa; Akira	Ibaraki			JP
Kuchikata; Masuo	Ibaraki			JP
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP

US-CL-CURRENT: 504/206; 504/360

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☒ 10. Document ID: US 6030923 A

L7: Entry 10 of 28

File: USPT

Feb 29, 2000

US-PAT-NO: 6030923

DOCUMENT-IDENTIFIER: US 6030923 A

**** See image for Certificate of Correction ****

TITLE: Liquid agricultural chemical composition

DATE-ISSUED: February 29, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Okano; Tetsuya	Wakayama			JP
Hasebe; Keiko	Wakayama			JP
Suzuki; Tadayuki	Wakayama			JP
Hioki; Yuichi	Wakayama			JP
Sato; Tatsuo	Ibaraki			JP

US-CL-CURRENT: 504/362; 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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Terms	Documents
15 and L6	28

Display Format: [Change Format](#)[Previous Page](#)[Next Page](#)

WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 11 through 20 of 28 returned.**☒ 11. Document ID: US 6008158 A

L7: Entry 11 of 28

File: USPT

Dec 28, 1999

US-PAT-NO: 6008158

DOCUMENT-IDENTIFIER: US 6008158 A

TITLE: Enhancer composition for agricultural chemicals and method for enhancing the efficacy of agricultural chemical

DATE-ISSUED: December 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hasebe; Keiko	Wakayama			JP
Tomioka; Keiichiro	Wakayama			JP
Suzuki; Tadayuki	Wakayama			JP
Hioki; Yuichi	Wakayama			JP

US-CL-CURRENT: [504/358](#); [424/405](#), [504/194](#), [504/206](#), [514/785](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

[R000C](#)☐ 12. Document ID: US 5948421 A

L7: Entry 12 of 28

File: USPT

Sep 7, 1999

US-PAT-NO: 5948421

DOCUMENT-IDENTIFIER: US 5948421 A

TITLE: Aqueous liquid agricultural composition

DATE-ISSUED: September 7, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Okano; Tetsuya	Wakayama			JP
Hasebe; Keiko	Wakayama			JP
Suzuki; Tadayuki	Wakayama			JP
Hioki; Yuichi	Wakayama			JP
Tomioka; Keiichiro	Wakayama			JP
Sato; Tatsuo	Ibaraki			JP

US-CL-CURRENT: [424/405](#); [424/406](#), [504/206](#), [514/114](#), [514/937](#), [514/971](#), [514/975](#)

☐ 15. Document ID: US 5849663 A

L7: Entry 15 of 28

File: USPT

Dec 15, 1998

US-PAT-NO: 5849663

DOCUMENT-IDENTIFIER: US 5849663 A

**** See image for Certificate of Correction ****

TITLE: Enhancer for agricultural chemicals, enhancer composition for agricultural chemicals and method for enhancing the efficacy of agricultural chemical

DATE-ISSUED: December 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hasebe; Keiko	Wakayama			JP
Tomioka; Keiichiro	Wakayama			JP
Suzuki; Tadayuki	Wakayama			JP
Hioki; Yuichi	Wakayama			JP

US-CL-CURRENT: 504/365; 424/405, 504/194, 504/206, 514/785

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 16. Document ID: US 5795847 A

L7: Entry 16 of 28

File: USPT

Aug 18, 1998

US-PAT-NO: 5795847

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: August 18, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 17. Document ID: US 5710104 A

L7: Entry 17 of 28

File: USPT

Jan 20, 1998

US-PAT-NO: 5710104

DOCUMENT-IDENTIFIER: US 5710104 A

TITLE: Glyphosate compositions comprising polyethoxylated monohydric primary alcohols

DATE-ISSUED: January 20, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Magin; Ralph W.	Baton Rouge	LA		
Sauer; Joe D.	Baton Rouge	LA		
Maloney; John R.	Baton Rouge	LA		

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 18. Document ID: US 5656572 A

L7: Entry 18 of 28

File: USPT

Aug 12, 1997

US-PAT-NO: 5656572

DOCUMENT-IDENTIFIER: US 5656572 A

TITLE: Method of controlling weeds

DATE-ISSUED: August 12, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchikata; Masuo	Ibaraki			JP
Prill; Erhard J.	Kirkwood	MO		
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP
Surgant; John M.	Clayton	MO		
Wright; Daniel R.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/362, 504/367

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 19. Document ID: US 5538937 A

L7: Entry 19 of 28

File: USPT

Jul 23, 1996

US-PAT-NO: 5538937

DOCUMENT-IDENTIFIER: US 5538937 A

TITLE: Agricultural chemical composition comprising quaternary ammonium enhancers

DATE-ISSUED: July 23, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hasebe; Keiko	Wakayama-shi, Wakayama			JP
Hioki; Yuichi	Wakayama-shi, Wakayama			JP
Tachizawa; Osamu	Wakayama-shi, Wakayama			JP
Tomifuji; Takeshi	Wakayama-shi, Wakayama			JP
Kato; Tohru	Wakayama-shi, Wakayama			JP
Nishimoto; Uichiro	Wakayama-shi, Wakayama			JP
Nishimoto; Yoshifumi	Kainan-shi, Wakayama			JP
Sotoya; Kohshiro	Naga-gun, Wakayama			JP

US-CL-CURRENT: 504/358; 504/201, 504/206, 504/330, 514/122, 514/132, 514/369,
514/493, 514/788

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 20. Document ID: US 5525576 A

L7: Entry 20 of 28

File: USPT

Jun 11, 1996

US-PAT-NO: 5525576

DOCUMENT-IDENTIFIER: US 5525576 A

TITLE: Seed hull extract assimilation agents for agrochemical compositions

DATE-ISSUED: June 11, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Medina-Vega; Luis R.	Chihuahua			MX
Hickey; Joseph A.	Lakeland	FL	33813	
Dillon; Lewis E.	McAllen	TX	78504	

US-CL-CURRENT: 504/358; 504/177, 504/206, 504/211, 504/212, 504/213, 504/214,
504/215, 504/248, 504/292, 504/299, 504/353, 504/354, 514/231.2, 514/477, 514/783,
514/784, 514/946

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

Generate Collection

Print

Terms	Documents
15 and L6	28

Display Format: Change Format

[Previous Page](#)

[Next Page](#)

WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 21 through 28 of 28 returned.**☐ 21. Document ID: US 5411944 A

L7: Entry 21 of 28

File: USPT

May 2, 1995

US-PAT-NO: 5411944

DOCUMENT-IDENTIFIER: US 5411944 A

**** See image for Certificate of Correction ****TITLE: Glyphosate-sulfuric acid adduct herbicides and use

DATE-ISSUED: May 2, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Young; Donald C.	Fullerton	CA		

US-CL-CURRENT: 504/206; 504/123

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC
Draw Desc	Image										

☐ 22. Document ID: US 5302579 A

L7: Entry 22 of 28

File: USPT

Apr 12, 1994

US-PAT-NO: 5302579

DOCUMENT-IDENTIFIER: US 5302579 A

**** See image for Certificate of Correction ****TITLE: Herbicide and method using adduct of glyphosate, sulfuric acid and chalcogen compound

DATE-ISSUED: April 12, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Young; Donald C.	Fullerton	CA		

US-CL-CURRENT: 504/206; 527/300

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC
Draw Desc	Image										

☐ 23. Document ID: US 5116401 A

L7: Entry 23 of 28

File: USPT

May 26, 1992

US-PAT-NO: 5116401

DOCUMENT-IDENTIFIER: US 5116401 A

TITLE: Herbicide and method with the glyphosate-urea adduct of sulfuric acid

DATE-ISSUED: May 26, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Young; Donald C.	Fullerton	CA		

US-CL-CURRENT: 504/196; 504/201, 504/203, 504/205, 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw Desc	Image									

☐ 24. Document ID: US 4399287 A

L7: Entry 24 of 28

File: USPT

Aug 16, 1983

US-PAT-NO: 4399287

DOCUMENT-IDENTIFIER: US 4399287 A

TITLE: Phosphinic acid derivatives

DATE-ISSUED: August 16, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baillie; Alister C.	Bottisham			GB2
Wright; Brian J.	Bishops Stortford			GB2
Wright; Kenneth	Lode			GB2
Earnshaw; Christopher G.	Chesterton			GB2

US-CL-CURRENT: 548/119; 504/175, 504/195, 504/197, 504/201, 504/202, 504/203,
504/204, 504/205, 504/206, 504/207, 504/208, 558/168, 558/169, 558/170, 558/175,
558/179, 558/182, 558/231, 558/300, 558/386, 560/179, 987/178, 987/180, 987/185,
987/186, 987/63

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw Desc	Image									

☐ 25. Document ID: US 4265654 A

L7: Entry 25 of 28

File: USPT

May 5, 1981

US-PAT-NO: 4265654

DOCUMENT-IDENTIFIER: US 4265654 A

**** See image for Certificate of Correction ****

TITLE: Herbicidal compositions

DATE-ISSUED: May 5, 1981

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Takematsu; Tetsuo	Utsunomiya			JP
Konnai; Makoto	Utsunomiya			JP
Tachibana; Kunitaka	Yokohama			JP
Tsuruoka; Takashi	Kawasaki			JP
Inouye; Shigeharu	Yokohama			JP
Watanabe; Tetsuro	Yokohama			JP

US-CL-CURRENT: 504/206; 504/190, 987/186

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☐ 26. Document ID: US 4211548 A

L7: Entry 26 of 28

File: USPT

Jul 8, 1980

US-PAT-NO: 4211548

DOCUMENT-IDENTIFIER: US 4211548 A

TITLE: Esters of N-phosphinothioylmethylglycine and herbicidal method

DATE-ISSUED: July 8, 1980

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Franz; John E.	Crestwood	MO		
Kaufman; Robert J.	University City	MO		

US-CL-CURRENT: 504/206; 558/169, 987/160

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☒ 27. Document ID: US 4159901 A

L7: Entry 27 of 28

File: USPT

Jul 3, 1979

US-PAT-NO: 4159901

DOCUMENT-IDENTIFIER: US 4159901 A

TITLE: Corrosion inhibited agricultural compositions

DATE-ISSUED: July 3, 1979

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Beestman; George B.	St. Louis	MO		
Prill; Erhard J.	Kirkwood	MO		

US-CL-CURRENT: 504/206; 252/395, 422/12, 422/14, 422/15

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 28. Document ID: US 4120689 A

L7: Entry 28 of 28

File: USPT

Oct 17, 1978

US-PAT-NO: 4120689

DOCUMENT-IDENTIFIER: US 4120689 A

**** See image for Certificate of Correction ****TITLE: Benzyl and aryl esters of N-phosphonomethyl glycines, herbicidal compositions and use thereof

DATE-ISSUED: October 17, 1978

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dutra; Gerard A.	Ladue	MO		

US-CL-CURRENT: 504/206; 504/175, 558/134, 558/169, 987/160

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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[Generate Collection](#)[Print](#)

Terms	Documents
15 and L6	28

Display Format:

-

[Change Format](#)[Previous Page](#)[Next Page](#)

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Generate Collection

Print

L7: Entry 4 of 28

File: USPT

Nov 5, 2002

DOCUMENT-IDENTIFIER: US 6475954 B2

TITLE: Solid glyphosphate-formulation and manufacturing process

Abstract Text (1):

Disclosed is a solid formulation of the herbicidal active agent glyphosate [N-(phosphonomethyl)glycine] compressed into tablet form. It is applied in the agricultural and horticultural sectors to destroy unwanted vegetation. The solid formulation according to the invention consists essentially of free glyphosate acid, salifying agents (alkali or ammonium hydrogencarbonate or carbonate in conjunction with solid organic acids), biological activating agents and diluents. A suitably sized tablet can consequently be adapted to supply an appropriate dose of spray mixture per surface unit for small-scale users. Submerging in water causes the glyphosate to convert into a soluble salt. The resulting carbon dioxide facilitates rapid disintegration of the tablet.

Brief Summary Text (2):

The invention is in a composition of a solid, hydrosoluble formulation containing glyphosate as the active agent for the destruction and/or control of unwanted vegetation and a process for the manufacture of the composition.

Brief Summary Text (3):

Glyphosate [N-phosphonomethyl)glycine] is generally recognized as a highly-effective and efficient herbicide. It is also known that glyphosate is an organic acid which is relatively insoluble in water. Consequently, glyphosate acid is applied as a hydrosoluble salt.

Brief Summary Text (4):

The formulation and application of glyphosate as an ammonium or isopropyl ammonium salt is widespread (U.S. Pat. No. 3,799,758 and Proc. North Cent. Weed Control Conf., 1971, 26, 64).

Brief Summary Text (5):

The manufacture and application of a hydrosoluble glyphosate formulation containing sodium salt has also been the subject of many publications (e.g. U.S. Pat. No. 4,140,513).

Brief Summary Text (6):

Auxiliary agents and/or components to improve effectiveness have also been added to solid glyphosate salt formulations in the prior art. Commonly used additives are ionic and non-ionic surfactants, biological activating agents, extenders, bonding agents and diluents, anticaking agents, foam inhibitors and thickeners (ER 220902, EP 255760, EP 378985, EP 498145, EP 448538, WO 93/25081, Monsanto Research Disclosure No. 27161 "Novel Glyphosate acid wetcake powder formulation effective in control of weeds").

Brief Summary Text (7):

Commercial liquid glyphosate formulations can easily be diluted in water to the required concentration for application. Their disadvantage is their poor transportability, since these formulations contain more than 50% water.

Brief Summary Text (8):

The alternative is a solid, hydrosoluble formulation in the form of granules,

- pellets, pastes or spray dried powders. The disadvantage with these solid formulations is the high cost of manufacture since they generally originate as a glyphosate wetcake or slurry which must then, after homogenization of the components, be desiccated at high energy costs.

Brief Summary Text (10):

The objectives of the present invention are to avoid the aforementioned disadvantages for the small-scale user, to provide a composition for a solid glyphosate salt formulation which is easy to dose, dissolves quickly in water, is inexpensive and is therefore consumer-friendly, as well as a process for its manufacture.

Brief Summary Text (12):

The objectives are obtained by a composition of the invention. The invention accordingly comprises a solid, hydrosoluble composition for horticultural and agricultural use in the destruction and/or control of unwanted vegetation with the herbicidal active agent glyphosate in the form of its salts, containing the following minimum components: 10 to 30 wt.-% of N-(phosphonomethyl)glycine (glyphosate); 12 to 52 wt.-% of alkali or ammonium hydrogencarbonate or carbonate; 10 to 20 wt.-% of citric acid, oxalic acid or adipic acid; 0.5 to 2 wt.-% of hydrosoluble cellulose; 8 to 12 wt.-% of alkyl ether sulphosuccinates, alkyl ether phosphates; ethoxylated fatty amines and/or ethoxylated fatty alcohols; 50 to 60 wt.-% of alkali or ammonium hydrogencarbonate or carbonate; ammonium sulphate, urea; 0.2 to 1 wt.-% of polydimethyl siloxane; and 1 to 5 wt.-% of polyether siloxane.

Brief Summary Text (13):

In a preferred embodiment the composition has a glyphosate content of 18 to 22 wt.-% and about 10 wt.-% of a surfactant of one or more of ether sulphosuccinate, alkyl ether phosphate, ethoxylated fatty amine and/or ethoxylated fatty alcohol.

Brief Summary Text (15):

Alkyl ether sulphosuccinates, alkyl ether phosphates, ethoxylated fatty alcohols and/or ethoxylated fatty amines are used as surfactants. Apart from their surface-active effect, the surfactants used also serve to reinforce the herbicidal effect (biological activating agents). Polyether siloxanes are also used as biological activating agents. Alkali and/or ammonium hydrogencarbonates or carbonates are used in conjunction with the organic acids such as citric acid, oxalic acid or adipic acid and hydrosoluble cellulose to accelerate disintegration, producing carbon dioxide bubbles, while sodium, potassium and/or ammonium hydrogencarbonate or carbonate, urea and alkali and/or ammonium sulphate are used as extenders, bonding agents and/or diluents. Polydimethyl siloxanes are used as foam inhibitors.

Brief Summary Text (16):

It has been discovered that the homogenized components of the formulation could be compressed into stable tablets, and that these tablets effervesced and dissolved clearly in water. The dose and size of the tablet can be adapted to contain the required defined quantity of glyphosate active agent for 5, 10 or 20 litres of spray mixture.

Detailed Description Text (3):

Example 1 21% glyphosate free acid (95%) 12% sodium hydrogencarbonate 10% Geropon CF/320 57% ammonium sulphate

Detailed Description Text (4):

Example 2 21% glyphosate free acid (95%) 14% sodium carbonate 10% Geropon CF/320 55% ammonium sulphate

Detailed Description Text (5):

Example 3 21% glyphosate free acid (95%) 13% potassium hydrogencarbonate 10% Geropon CF/320 56% ammonium sulphate

Detailed Description Text (6):

Example 4 21% glyphosate free acid (95%) 17% potassium carbonate 10% Geropon CF/320 52% ammonium sulphate

2. The composition of claim 1 comprising 18 to 22 wt.-% N-(phosphonomethyl)glycine (glyphosate) content.

6. A tablet comprising the composition of claim 1 wherein the tablet comprises an amount of active agent glyphosate for 5, 10 or 20 litres of spray mixture.

8. The process of claim 7 wherein the composition comprises 18 to 22 wt.-% N(phosphonomethyl)glycine (glyphosate) content.

18. A composition comprising: an aqueous solution of a) 10 to 30 wt.-% of N-(phosphonomethyl)glycine (glyphosate); b) 12 to 52 wt.-% of a salt forming agent; c) 10 to 20 wt.-% of citric acid, oxalic acid or adipic acid; d) 0.5 to 2 wt.-% of hydrosoluble cellulose; e) 8 to 12 wt.-% of alkyl ether sulphosuccinate, alkyl ether phosphate, ethoxylated fatty amine and/or an ethoxylated fatty alcohol; f) 50 to 60 wt.-% of a bonding agent; g) 0.2 to 1 wt.-% of polydimethyl siloxane; and h) 1 to 5 wt.-% of polyether siloxane.

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L7: Entry 6 of 28

File: USPT

Mar 20, 2001

DOCUMENT-IDENTIFIER: US 6204223 B1

TITLE: Packaged agrochemical composition

Brief Summary Text (2):

A gel (comprising a hazardous product, a surfactant, an acrylic acid polymer or copolymer and water) which is suitable for packaging in a water-soluble sachet is disclosed in W092/01377. An aqueous composition, comprising a hazardous product, an electrolyte and water and packaged in a water-soluble bag, is disclosed in EP-A1-0518689. It has been found that, when the aqueous compositions of the prior art are packaged in water-soluble sachets (such as sachets made from polyvinyl alcohol), water from the composition permeates through the wall of the sachet. The water that permeates can affect the outer surface of the sachet (for example by causing the bag to dissolve or adhere to the secondary packaging) and, thereby, reduce the shelf-life of the packaged product.

Brief Summary Text (20):

The water-soluble agrochemically active ingredient, is, for example, a herbicide (such as a paraquat salt (for example paraquat dichloride or paraquat bis(methylsulphate)), a diquat salt (for example diquat dibromide or diquat alginate) or glyphosate or a salt or ester thereof (such as glyphosate isopropylammonium, glyphosate sesquisodium or glyphosate trimesium (also known as sulfosate)), an insecticide or a fungicide. It is preferred that the water-soluble agrochemical is paraquat dichloride, diquat dibromide, glyphosate isopropylammonium or glyphosate trimesium (also known as sulfosate).

Brief Summary Text (21):

An electrolyte can be added to the composition to increase its ionic strength. The electrolyte helps to improve the insolubility of the material from which the sachet is made in the composition. (See polyvinyl Alcohol--Properties and Applications pages 38-43, edited by C. A. Finch, published by J Wiley & Sons in 1973 and EP-A1-0518689.) Suitable electrolytes may, for example, comprise a cation or mixtures of cations selected from the list comprising: ammonium, copper, iron, magnesium, potassium and sodium; and an anion or mixture of anions selected from the list comprising: sulphate, nitrate, fluoride, chloride, bromide, iodide, acetate, tartrate, ammonium tartrate, benzenesulphonate, benzoate, bicarbonate, carbonate, bisulphate, bisulphite, sulphate, sulphite, borate, borotartrate, bromate, butyrate, chlorate, camphorate, chlorite, cinnamate, citrate, disilicate, dithionate, ethylsulphate, ferricyanide, ferrocyanide, fluorosilicate, formate, glycerophosphate, hydrogenphosphate, hydroxostannate, hypochlorite, hyponitrite, hypophosphite, iodate, isobutyrate, lactate, laurate, metaborate, metasilicate, methionate, methylsulphate, nitrite, oleate, orthophosphate, orthophosphite, orthosilicate, oxalate, perborate, perchlorate, phosphate, polyfluoride, polychloride, polyiodide, polybromide, polysulphide, polysulphate, polysulphite, salicylate, silicate, sorbate, stannate, stearate, succinate or valerate. Preferred electrolytes are ammonium sulphate, sodium sulphate, potassium sulphate, copper sulphate, ammonium nitrate, sodium nitrate, magnesium sulphate, potassium citrate, potassium nitrate, sodium chloride or potassium chloride.

Brief Summary Text (27):

Depending on the nature of the water-soluble, agrochemically active ingredient, one or more adjuvants or co-formulants (such as a wetter or anti-freezing agent) may also be comprised in the composition. Suitable adjuvants include neutral or anionic

surfactants [such as a soap, a salt of an aliphatic monoester of sulphuric acid (for example, sodium lauryl sulphate), a salt of a sulphonated aromatic compound (for example, sodium dodecylbenzenesulphonate) or an alkyl glucoside] or polysaccharides. Suitable wetters include an alkyl glucoside (such as AL2042), a salt of a sulphonated aromatic compound (for example, sodium dodecylbenzenesulphonate), an alcohol ethoxylate or a diglucamide. Suitable thickeners include grades of xanthan gum (such as KELTROL.RTM. BT and KELZAN.RTM.).

Detailed Description Paragraph Table (1):

Component Function Concentration (g/l) Paraquat dichloride Active ingredient 200
Emetic Emetic 0.5 AL2042 (Note 1) Surfactant 100 "Dried" Magnesium sulphate
Electrolyte 140 KELTROL .RTM. BT (Note 2) Gelling agent 3 SILCOLAPSE .RTM. 5020
Antifoam 1 SULFACIDE .RTM. blue 5J Colour 5 Sodium hydroxide pH adjuster To pH 7
Water Make-up solvent To 1 liter Note 1: AL2042 is a proprietary blend of alkyl
polyglucoside and ethoxylated amine surfactants supplied by ICI Surfactants. Note 2:
KELTROL .RTM. BT is a salt tolerant grade of xanthan gum supplied by Kelco.

Detailed Description Paragraph Table (2):

Component Function Concentration (g/l) Paraquat dichloride Active ingredient 200
Emetic Emetic 0.5 AL2042 Surfactant 100 "Dried" Magnesium sulphate Electrolyte 140
KELTROL .RTM. BT Gelling agent 3 See TABLE I Permeation inhibitor 50 SILCOLAPSE
.RTM. 5020 Antifoam 1 SULFACIDE ` blue 5J Colour 5 Sodium hydroxide pH adjuster To
pH 7 Water Make-up solvent To 1 liter

Detailed Description Paragraph Table (5):

Component Function Concentration (g/l) Paraquat dichloride Active ingredient 200
Emetic Emetic 0.5 AL2042 Surfactant 100 Magnesium sulphate hydrate Electrolyte 234
(MgSO.sub.4.7H.sub.2 O) KELTROL .RTM. BT Gelling agent 3 PRIOLUBE .RTM. 1403
Permeation inhibitor 50 SILCOLAPSE .RTM. 5020 Antifoam 1 SULFACIDE .RTM. blue 5J
Colour 5 Sodium hydroxide pH adjuster To pH 6.5-7 Water Make-up solvent To 1 liter

Detailed Description Paragraph Table (8):

TABLE IV Example No. 12 13 Component Sulfosate (g) 300 Glyphosate (g) 240 AL2042 (g)
100 Ammonium sulphate (g) 241 241 KELTROL .RTM. BT (g) 3 3 SILCOLAPSE .RTM. 5020 (g)
1 1 SULFACIDE .RTM. blue 5J (g) 5 5 Methyl oleate (g) 50 50 Water to 1 liter to 1
liter Weight Loss (%) Replicate a 0.02 (0.08) 0.02 (0.16) Replicate b 0.00 (0.06)
0.10 (1.23) Replicate c 0.04 (0.12) 0.08 (0.31)

Current US Cross Reference Classification (5):

504/206

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L7: Entry 7 of 28

File: USPT

Jan 30, 2001

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

Abstract Text (1):

Stable, concentrated herbicide preparation comprising at least one herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group suspended in finegrained form in a liquid phase, and at least 5% a by weight of a dissolved electrolyte; a process for producing said herbicide preparation and an activating additive (adjuvant) for combination with said herbicide preparation. Preferred suspensions comprise the herbicides glyphosate and glufosinate and the electrolyte ammonium sulphate, acting synergistically. It has not hitherto been possible to incorporate high concentrations of synergistic electrolytes in liquid concentrates of said herbicides.

Brief Summary Text (2):

It is customary to produce herbicide preparations as suspensions in water. But normally the content of electrolytes in the aqueous phase is low, since a high content of electrolytes in water has a tendency to lower the solubility of the additives being necessary to stabilize the herbicide suspension. Amongst these additives, the surfactants are particularly important, said surfactants being necessary to ensure the wetting in connection with the grinding of the suspended herbicide, and being often desirable in connection with the intrusion of the herbicides in the weeds. Often only a few surfactants are suitable to ensure, in an appropriately broad temperature interval from -10.degree. C. to approximately 50.degree. C., that the suspension is effectively wetted and also flows satisfactorily. Additionally the suspensions almost always contain soluble, viscosity regulating compounds, ensuring that the viscosity in a broad temperature interval does not fall below a certain low value in order to avoid precipitation of the suspended herbicide. A too high content of electrolytes in the aqueous phase might lead to the gelatination or precipitation of the viscosity regulating compounds. The surfactants as well as the viscosity regulating compounds and eventually a certain amount of a dissolved glycol component can ensure, that the suspension after freezing and subsequent unfreezing thaws out again as a flowable, not gritty suspension.

Brief Summary Text (3):

In published european patent application EP 388.239 A1 pesticide suspensions are described, in which a certain amount of electrolytes is desirable. The suspension of finely ground pesticides in a concentration from 10-70% by weight in aqueous, structured systems of surfactants is described. The following pesticides are mentioned explicitly: ethofumesate, phenmedipham, dazomet, mancozeb, methylene bistiocyanate, amitraz and triforine. None of these pesticides contains both an acid and an amino group. The wording "structured systems of surfactants" is intended to mean aqueous systems, in which the surfactants form mesophases comprising structures larger than conventional spherical micelles and mutually interacting to form thixotropy in the aqueous medium. The structure comprises multilayers of spherulites or lamellae dispersed or emulsified as rods or discs in an outer aqueous phase, the size being normally 0.5-20 .mu.m. In the 14 examples of the application the not surface active electrolytes are present in an amount of 1.2-6.4% by weight of the total composition. It is a characteristic feature of this system, that the surfactant and the electrolyte must be adapted to each other as regards composition

- Brief Summary Text (4) :

Brief Summary Text (5) :

Brief Summary Text (6):

Brief Summary Text (7) :

Brief Summary Text (8) :

Brief Summary Text (9):

UK patent application GB 2.245.170 A claims solutions of glyphosate containing ethoxylated phosphate esters as surfactants. In the examples, where ammonium sulphate has been added supplementary to the formulation in amounts of 200-300 g/l, the glyphosate constitutes 75 g/l corresponding to 100 g/l of the isopropylammonium salt.

Brief Summary Text (10):

In European patent application EP 441.764 A1 is mentioned, that alkoxyated, quaternary ammonium compounds especially coethoxylated-propoxylated quaternary ammonium compounds, is environmentally more acceptable and less skin and eye irritating than ethoxylated fatty amines. It is stated, that aqueous solutions of glyphosate in combinations with said surfactants also can contain ammonium sulphate, but no examples with such formulations are given. On the other hand two solid compositions containing ammonium sulphate are described.

Brief Summary Text (11):

In European patent application EP 498.785 A1 glyphosate formulations are mentioned, which contain esters of sorbitol and fatty acids as surfactants in combination with another surfactant. It is mentioned, that these formulations whether aqueous solutions or solid, finely distributed formulations may also contain ammonium sulphate or other inorganic ammonium salts. The system, however, seems to be best suited for solid formulations.

Brief Summary Text (12):

European patent application EP 498.145 A1 describes solid compositions containing glyphosate as free acid or salt, an inorganic ammonium salt (preferably ammonium sulphate) and alkyl-glycoside or alkylpolyglycoside as surfactant.

Brief Summary Text (13):

European patent application EP 448.538 A1 describes combinations of glyphosate and oxyfluorfen in solid formulations, additionally containing ammonium sulphate and other inorganic compounds.

Brief Summary Text (14):

International patent application WO 92/12637 deals with solid, preferably extruded or granulated formulations containing glyphosate in combination with alkaline compounds. A reaction takes place between the glyphosate and the alkaline compound either during the production process or during the subsequent mixing with the diluent water to totally or partly neutralize the glyphosate as salt whereby it dissolves easier and more quickly. The formulations shown besides comprise surfactants and frequently ammonium sulphate.

Brief Summary Text (15):

In danish patent application no. 6490/89 solid formulations of glyphosate in acid form containing a saturated C.sub.16-18 -fatty alcohol, being ethoxylated with approximately 25 moles ethyleneoxide are described. The formulations may additionally contain supplementary ammonium sulphate.

Brief Summary Text (17):

European patent application 243.872 A1 discloses pesticide preparations, comprising inter alia glyphosate dispersed in an oil containing, liquid phase. The addition to the formulations of ammonium sulphate is not mentioned.

Brief Summary Text (18):

French patent application 2.661.315 discloses the suspension of glyphosate and derivatives thereof in an organic solvent. The organic solvent might be water miscible, and it is mentioned that up to 50% of the solvent may be replaced by water. Furthermore the composition may comprise ammonium sulphate, which is characterized as an adjuvant. The form of the ammonium sulphate of the composition is not apparent from the description, but in the 5 examples of the application, the ammonium sulphate together with the glyphosate compound seems to be totally suspended or dissolved only to a limited extent in the liquid phase.

Brief Summary Text (19):

International patent application WO 92/21686 describes the production of trimethylsulfonium salt of glyphosate for instance by the reaction of glyphosate trimethylsulfonium hydrogen sulphate with an alkaline compound like ammonia. The application does not mention herbicidal suspensions in relation to the present invention. No description is found, neither in the patent description nor in the examples, of significant amounts of glyphosate being at any time suspended in an electrolyte solution and certainly not in a stable form. The principles of the

- present invention for formulating glyphosate, seem never to have been considered.

Brief Summary Text (20):

Many of the examples shown demonstrate the desirability of combining the herbicides glyphosate or glufosinate with ammonium sulphate and selected surfactants in one and the same formulation. Advantageously the formulation is as concentrated as possible.

Brief Summary Text (21):

As far as liquid, dissolved formulations are concerned, the ammonium sulphate has a salting-out effect on the dissolved salts of glyphosate and glufosinate, as well as on the dissolved surfactants, and an upper limit exists of the concentration of the solution dependent on the actual surfactant. Environmental requirements on the detergents, for instance as to biodegradability, poor toxicity towards fishes and low skin and eye irritation may reduce still further the number of relevant wetting agents. Besides, the various surfactants differ significantly in their promotion of the biological effect of glyphosate and glufosinate.

Brief Summary Text (22):

Therefore, the trend in recent developments is towards solid, finely dispersed and non-dusty formulations. Although the solubility of ammonium sulphate in water is big, the speed of dissolution of ordinary, commercial, crystalline ammonium sulphate in water in practice is hardly acceptable. Consequently, the crystalline ammonium sulphate frequently needs to be grinded before being mixed with glyphosate or glufosinate or preferably a salt thereof, the selected surfactant(s) and additive(s) being subsequently added. Amongst the additives adhesives, absorbing fillers or anticaking agents should be mentioned, which are necessary to obtain a finely dispersed, non-caking and easily flowing, solid formulation of adequate storage stability. For these processes an expensive formulation equipment is necessary.

Brief Summary Text (26):

The present invention is based on the surprising fact, that a stable suspension can be attained by grinding a powdered herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group in a bead mill in a highly concentrated solution of an electrolyte, which is not a surfactant per se, even if no surfactant is present.

Brief Summary Text (29):

2) It is necessary to add a surfactant to ensure optimal wetting of the suspended particles of herbicide in the liquid. If the wetting is insufficient, the suspension will become thick and consequently impossible to grind in wet condition in a bead mill.

Brief Summary Text (33):

Herbicides with at least one primary, secondary and/or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group normally have a relatively high solubility in water: about 0.1 corresponding to 1000 ppm or more, preferably at least 0.4% corresponding to 4000 ppm; by way of example the solubility of glyphosate is approximately 1% by weight in pure water at 20.degree. C.

Brief Summary Text (35):

According to the invention, the wet grinding of a compound, which is almost insoluble in the liquid phase, seems to take place without serious viscosity problems, even if no surfactant is added. This is very untypical. The reason could be, that the herbicide molecule contains an amino group as well as two acid groups. This explanation is made probable by the fact, that the surfactants being most difficult to salt out in electrolyte solutions, are those containing both negatively and positively charged hydrophilic groups.

Brief Summary Text (36):

The fact, that the grinding can take place without viscosity problems, even when no surfactant is added, is probably an essential condition for realising the invention. Even if a surfactant were added, the salting out from the electrolyte of the compound would generally be so extensive, that the wetting effect of the

insignificant amount still dissolved in the water phase would be too small to influence significantly on the grinding. The surfactant, however, is still desirable. As mentioned above said surfactant is necessary to ensure the optimum, biological effect of the formulation, and it might contribute to the stabilization of the final formulation, i.e. ensure that the formulation remains homogenous and does not separate. Apparently the finely grinded suspended herbicide and the added, finely distributed surfactant mutually interact to produce a mixture of an advantageous pseudoplastic or thixotropic character. Accordingly, it is possible to produce stable formulations comprising as the sole components water with dissolved electrolyte, suspended glyphosate and surfactant. It is even possible to produce stable suspensions using no surfactants at all.

Brief Summary Text (37):

When a surfactant is included in the suspension the surfactant mainly appears to be uniformly distributed on the finely grinded herbicide particles. This fact might contribute further to the stabilization of compositions, inter alia the coating causes the density differences between the suspended and the liquid phase to be reduced.

Brief Summary Text (41):

b) An adjustment of the density of the grinded herbicide and the density of the electrolyte solution in order to minimize the difference is possible, whereby the separation tendency in the suspension becomes very low. By coating the surfactant on the suspended herbicide further variations can be obtained. In French application 2.661.315, the herbicide as well as the electrolyte has to be suspended in the liquid phase, and there is accordingly no such possibility of adjusting the density of the liquid phase or of coating the suspended particles with the surfactants.

Brief Summary Text (43):

d) In suspension preparations the amount of suspended solid material in a liquid phase must be below a certain upper limit. Normally the practical limit is about 500 g/l suspension. In glyphosate preparations containing ammonium sulphate the desired content of ammonium sulphate as well as that of glyphosate is high, and this is not possible to obtain if both compounds are to be suspended. When the ammonium sulphate is dissolved in the water phase and the glyphosate only is dispersed herein, it is possible to increase the amounts of ammonium sulphate as well as glyphosate.

Brief Summary Text (46):

The invention accordingly relates to stable, concentrated herbicide preparations comprising at least one herbicide in an amount of 5-58% by weight, said herbicide being fine-grained and suspended in a liquid aqueous phase, and said herbicide containing at least one primary, secondary or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group, said herbicide preparations being characterized by comprising at least 5% by weight of an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant.

Brief Summary Text (51):

Specially preferred herbicides are glyphosate (N-(phosphonomethyl)-glycine), glufosinate (4-(hydroxy(methyl)phosphinoyl)-DL-homoalanine), bilanafos (4-hydroxy(methyl)phosphinoyl)-L-homoalanyl-L-alanyl-L-alanine and/or glyphosine (N,N-bis(p-hosphonomethyl)glycine), compare claim 4.

Brief Summary Text (58):

The invention also relates to stable, activating additives (adjuvants) on concentrated form, said adjuvants being active when admixed with glyphosate- and/or glufosinate preparations for combatting weeds, and said additives comprising at least one surfactant in an amount of 4-58% by weight, said surfactant being emulsified, suspended and/or dissolved in a liquid, aqueous phase; the composition of the adjuvant being further characterized by comprising at least one undissolved, fine-grained, not biologically active viscosity regulating filler acting to prevent separation of the surfactant, said viscosity regulating filler comprised in an amount of min. 0.3% by weight, and said liquid, aqueous phase being characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of min. 5%, compare claim 19.

Such a stable, activating additive is in a way an intermediate for the production of a concentrated suspension of glyphosate and/or glufosinate according to the invention, since the herbicide suspension can be produced from the additive simply by admixing finely grinded herbicide.

The non-ionic surfactants may be selected from among such which are ethoxylated, propoxylated or co-ethoxylated/propoxylated surfactants. The hydrophobic part of the non-ionic surfactants may be selected from the group consisting of mono-, di- or tristyrylphenol, naphtol, mono-, di- or tristyrylnaphtol, dicyclohexylphenol, mono-,

di- or tristyryl-dicyclohexylphenol, phenylphenol, mono-, di- or tristyryl-phenylphenol, benzylphenol, mono-, di- or tristyryl-benzylphenol, formaldehyde condensed phenol or formaldehyde condensed naphthol, in which the above mentioned hydrophobic parts may be substituted with one, two, three or four C.sub.1-15 -alkyl groups, or the hydrophobic part may be selected from mono-, di-, tri- or tetra-C.sub.1-18 -alkylphenol or mono-, di-, tri- or tetra-C.sub.1-18 -alkylnaphthol or C.sub.8-30 -hydrocarbylalcohol, C.sub.8-30 hydrocarbylcarboxylic acid, C.sub.8-30 -hydrocarbylene-di-carboxylic acid and abeetic acid (rosin acid). Other corresponding non-ionic surfactants being methylated in the terminal OH-group of the polyalkoxylene groups or in which said OH-group is linked to a new hydrocarbyl-group, preferably with the same composition as already mentioned, may be used, too.

Brief Summary Text (80):

From among the other types of non-ionic surfactants block-polymers (copolymerisates) of ethylene oxide and styrene and of ethylene oxide (ethylene glycol) and propylene oxide (propylene glycol) should be mentioned, whose molecular weight is in the interval from 1000 to approximately 15,000 Dalton, preferably from 1500 to approximately 12,000 Dalton and specially from 1,800 to approximately 10,000 Dalton.

Brief Summary Text (81):

Other preferred non-ionic surfactants are the ethoxylated, propoxylated or co-ethoxylated/propoxylated vegetable oils as for example ricinus oil; fatty acid esters of polyalcohol as for example sorbitol, in itself an emulsifier, which can be alkoxylated further (ethoxylated, propoxylated or co-ethoxylated/propoxylated); monoglycerides, diglycerides and polyalcoholates of natural fatty acids, which can be esterified further with C.sub.1-4 -monocarboxylic acid (e.g. acetic acid), C.sub.1-10 -dicarboxylic acid (e.g. adipic acid) and C.sub.1-6 -hydroxycarboxylic acid (e.g. lactic acid), and which can be alkoxylated further. Among other non-ionic wetting agents of relevance N-C.sub.4-16 -alkylpyrrolidone, specially N-C.sub.8-16 -alkylpyrrolidone, hydrocarbylcarboxylic amide and alkoxylated variants hereof; alkoxylated hydrocarbylmercaptane, alkoxylated thiophenol and alkoxylated thionaphthol should be mentioned.

Brief Summary Text (82):

Specially preferred non-ionic surfactants are alkylglycosides, alkylpolyglycosides, alkoxylated alkylglycosides, alkoxylated alkylpolyglycosides, alkoxylated saccharides, alkoxylated polysaccharides, alkoxylated acetylene diols containing a symmetrically substituted triple bond and ethoxylated polymethylsiloxanes, compare claim 13.

Brief Summary Text (83):

The anionic surfactants may be selected from the groups comprising phosphate esters of for instance alkoxylated styrylphenols, alkylphenols and hydrocarbylalcohols; substituted and unsubstituted sulfonic acids; esters and halfesters of sulfosuccinic acid; monosulphate esters of C.sub.8-20 -hydrocarbylalcohol and styrylalcohol derivatives; naphthalene sulfonic acid derivatives; sulfonated vegetable oils and sulfonated mono- and diesters of natural fatty acids and sulfonated fatty acids; C.sub.8-30 -hydrocarbylcarboxylic acid; C.sub.8-30 -hydrocarbylene-dicarboxylic acids illustrated by C.sub.4-16 -alkylsubstituted succinic acid; polycarboxylic acids; taurides and sarkosides and sulfamido carbonic acids. Additional types of anionic surfactants are (the corresponding) derivatives of polymethylsiloxanes.

Brief Summary Text (84):

The cationic surfactants may be selected from the group comprising C.sub.8-30 -hydrocarbylamine and C.sub.8-30 -hydrocarbyl-di- and triamine being alkoxylated with min. 1 preferably min. 2, especially min. 5 and specially min. 8 oxyethylene and/or oxypropylene groups; quaternary amines with min. one C.sub.8-30 -hydrocarbyl and/or hydrocarbylene group and their alkoxylated derivatives; and amine modified polymethylsiloxanes.

Brief Summary Text (85):

The amphoteric surfactants are characterized by comprising at least one C.sub.8-30 -hydrocarbyl or at least one C.sub.8-30 -hydrocarbylene group and always at least

one amino group and further one anionic group. The anionic group may preferably be selected from among carboxylic acid, sulfonic acid and phosphonic acid.

Brief Summary Text (86):

Surfactants with ionic groups may be used in their free, unreacted form, but will often be totally or partly reacted to salt. The composition should not at the same time comprise significant amounts of an anionic as well as a cationic surfactant, and the surfactants are generally selected accordingly.

Brief Summary Text (87):

Concerning those surfactants, for which it is possible to calculate a HLB-value (HLB=Hydrofil-Lipofil-Balance), this HLB-value should preferably not be too low. The HLB-value should be min. 3, preferably min. 4, especially min. 5, particularly min. 6 and specially min. 7.

Brief Summary Text (88):

Even though the presence of a surfactant in the herbicide suspension of the invention is desirable for biological reasons, a suspension comprising no surfactant has commercial interest, because of the possibility of adding separately the surfactant at the admixing stage of said suspension with the diluent water. The surfactant might be formulated as an activating additive according to the invention. The advantage of this system is, that the farmer may adjust individually the surfactant to the amount of herbicide.

Brief Summary Text (89):

It is possible to adjust the suspension to enable most surfactants to physically enter it. The suspended herbicide helps preventing the surfactant from separating out. The surfactant is generally present in the suspension in a non-structured form. Therefore in most of the described herbicide suspensions comprising a surfactant, the surfactant will separate as an independent, liquid phase or as solid particles in case the suspended herbicide and solid additives, if any, are removed from the suspensions.

Brief Summary Text (90):

The present invention does not relate to the final dilutions made at the user level. The invention relates to concentrates only, being herbicide preparations or activating additives, which according to the invention are formulated in a new and more advantageous way. Since dilutions of use, made from the concentrates to a certain extent are well known, because they can be obtained by separate addition of ammonium sulphate to known products, and they are known to possess a particularly satisfying biological effect, it seems redundant to prove the effect of the described compositions. There might be differences in the pH-values of the dilutions. For instance the pH-value of the herbicide preparations according to the invention is frequently low, because the glyphosate is preferably used in its non-neutralized form, but this fact is known to be of no biological importance. Reference is made in this connection to Danish patent application 6490/89, specially dealing with glyphosate on non-neutralized form.

Brief Summary Text (97):

Amongst other viscosity regulating compounds having the additional effect of improving the cold stability and acting hygroscopically, the compositions of the invention might comprise glycols, polyglycols, glycerine, polymerized glycerine, glycolethers, polyglycolethers, polyalcohols and urea, all having a solubility in water at 20.degree. C. of at least 1% by weight. Examples of glycols are ethylene glycol, propylene glycol and hexylene glycol. Examples of polyglycols are diethylene glycol, triethylene glycol, polyethylene glycol, dipropylene glycol, tripropylene glycol and water soluble polypropylene glycols. Examples of polyglycolethers are diethylene glycol butylether, dipropylene glycol methylether, dipropylene glycol butylether and tripropylene glycol butylether. Examples of polyalcohols are sorbitol, trimethylolpropan and pentaerythritol. None of the polyglycols, glycolethers and polyalcohols should be surfactants. The components of the abovementioned group of compounds may be present in the composition in an amount of max. 25%, preferably max. 18%, especially max. 11% and specially max. 7%; on the other hand they should be present in an amount of approximately min. 0.1%, preferably min. 0.7%, especially min. 1.4% and specially min. 2.4%, i.e. intervals

- of 0.1-25%, preferably 0.7-18%, especially 1.4-11% and specially 2.4-7%.

Brief Summary Text (98):

The compositions of the invention might comprise hygroscopic compounds, possibly also acting to stabilize pH and selected from the group consisting of hydroxycarboxylic acids, di- and tricarboxylic acids and their hydroxy acids, said acids being present as free acids and having a solubility in water at 20.degree. C. of at least 1% by weight. Examples of such acids are lactic acid, oxalic acid, succinic acid, tartaric and citric acid. The amount of these acids in the composition may be approximately 0.1-22%, preferably 0.4-16%, especially 1-11% and specially 2-7%.

Brief Summary Text (103):

The grinding and possibly the admixing may preferably take place in a bead mill, compare claim 17, for instance at a temperature in the interval of 0-50.degree. C. In order to maintain the temperature in this interval cooling of the bead mill with water or ice water will usually be necessary. If the surfactant has a higher melting point, it might be desirable to raise the temperature of the mill to 50-60.degree. C. for a period. This may be effected by temporarily stopping the cooling water. The surfactant is added in the molten state at the higher temperature, and finely grinded filler, if any, is usually added before the cooling with cooling water is resumed.

Brief Summary Text (104):

To avoid foaming it is frequently advantageous to postpone the addition of surfactant to after the grinding.

Brief Summary Text (107):

Specially preferred herbicide suspensions comprise glyphosate suspended in ammonium sulphate, said suspensions being produced by adding sulfuric acid to solutions of the ammonium salt of glyphosate or adding ammonia to a solution of the sulfuric acid salt of glyphosate, preferably while cooling and continuously stirring.

Brief Summary Text (112):

The amount of the herbicide, for instance glyphosate or glufosinate, constitutes 0.2-4 kg/ha, preferably 0.3-3 kg/ha, especially 0.5-2.2 kg/ha and specially 0.8-1.5 kg/ha, calculated on an active ingredient basis.

Detailed Description Text (2):

Experiments 1-5 (see table A) demonstrates the suspension of glyphosate in free, non-neutralized form in an aqueous solution of ammonium sulphate. Calculated on the aqueous solution the amount of ammonium sulphate is 40% in all 5 experiments corresponding to a saturation in water at approximately 0.degree. C. In all of the examples, ethoxylated fatty amines are used as surfactants.

Detailed Description Text (3):

For the manufacture of the compositions 1 and 2 the Genamine (the ethoxylated fatty amine) was initially dissolved in a part of the water, following which the pH was adjusted with concentrated sulfuric acid to pH=3.5. The rest of the water was then added and subsequently the ammonium sulphate was stirred in, leading to the precipitation of the chief of the Genamine. The mixture was transferred as quantitatively as possible to a mini-mill with a volume of maximally 50 ml from the company Eiger Engineering Ltd., Warrington, Cheshire, England, being filled with 1-2 mm zirconium oxide pearls. The mill was started immediately at its highest speed, and the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Attagel was added, and the grinding was continued for maximally 5 minutes.

Detailed Description Text (4):

For the manufacture of the compositions 3, 4 and 5, the ammonium sulphate was initially dissolved in the total amount of water, following which the concentrated sulfuric acid was added, and the solution was transferred to the mini-mill. The mill was started at its highest speed, following which the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Genamin was added immediately followed by

Detailed Description Text (6):

Detailed Description Text (18) :

Detailed Description Text (24):

Detailed Description Text (30):

Detailed Description Text (34):

Detailed Description Text (35):

Detailed Description Paragraph Table (2):

TABLE A Experiment no. 1															2															3															4															5															Compo- nents Composition in %															Deionized															41.6															41.1																																																																																																					
41.0	41.0	40.8	water	Ammonium	27.8	27.4	27.4	27.4	27.2	sulphate	Glyphosate,	20.8	20.6	20.6	20.6	20.4	98%	Genamin T	6.9	6.8	150	(1)	Genamin O	6.8	80	(2)	Genamin C	6.8	100	(3)	Genamin C	6.8	020	(4)	Sulfuric	app.	1.5	app.	1.4	2.1	2.1	2.7	acid,	98%	Attagel	(5)	1.4	2.7	2.1	2.1	2.1	Total weight	144	146	146	146	147	(g)	Density	1.30	1.29	1.28	1.28	1.25	(g/ml)	Glyphosate	270	266	264	264	255	(g/l)	Ammonium	361	353	351	351	340	sulphate	(g/l)	Evaluation before storage	Appearance	15% upp.	10% upp.	10% upp.	10% upp.	10% upp.	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	Viscosity	pseudo- slightly	pseudo- slightly	pseudo- pseudo-	pseudo- plastic	viscous	viscous	plastic	plastic	Particle	app.	10	app.	10	5-10	app.	10	5-10	size	(.mu.m)	Oil drops	n.d.	n.d.	n.d.	n.d.	n.d.	(.mu.m)	Evaluation after storage at various temperatures	Appearance	30% upp.	20% upp.	15% upp.	25% upp.	25% upp.	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	Viscosity	easily suffi-	suffici-	easily easily	ently ently	ently	Particle	app.	10	10-15	app.	10	10-15	5-10	size	(.mu.m)	Oil drops	n.d	n.d.	n.d.	n.d.	n.d.	n.d.	(.mu.m)	Speed of	4	6	3	3	2	dissol.	(s)	Evaluation after storage 14 days at 55.degree. C.	Appearance	15% upp.	5% upp.	10% upp.	10% upp.	10% inner	15% upp.	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	cl. phase	Viscosity	pseudo- slightly	pseudo- pseudo-	pseudo- pseudo-	pseudo- plastic	viscous	plastic	plastic	plastic	plastic	Particle	app.	10	10-15	app.	10	10-15	app.	10	10-15	app.	10	10-15	size	(.mu.m)	Oil drops	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	(.mu.m)	Speed of	3	4	4	2	7	dissol.	(s)

Detailed Description Paragraph Table (3):

TABLE B Experiment no. 6 7 8 9 10 Component Composition in % Deionized 40.5 40.5 40.5 40.5 water Ammonium 27.0 27.0 27.0 27.0 27.0 sulphate Glyphosate, 20.3 20.3 20.3 20.3 98% Ethoquad 10.2 C/25 (6) Emcol CC 10.2 55 (7) Ampholyt 10.2 SKKP-70 (8) Synperonic 10.2 NP-10 (9) Tween 20 10.2 (10) Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight 148 148 148 148 148 (g) Density 1.28 1.27 1.27 1.27 1.27 (g/ml) Glyphosate 260 258 258 258 258 (g/l) Ammonium 346 343 343 343 343 sulphate (g/l) Evaluation before storage Appearance no se- no se- 15% lower 15% lower 10% lower paration paration cl. phase cl. phase cl. phase Viscosity slightly easily slightly slightly viscous viscous viscous viscous Particle app. 10 app. 10 10-15 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. 25-100 (.mu.m) Evaluation after storage at various temperatures Appearance 20% upp. 30% upp. no se- 20% upp. 15% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily easily passende passende passende viscous viscous viscous Particle app. 5 app. 10 app. 10 app. 10 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 2 2 3 3 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance 10% upp. 25% upp. no se- no se- 10% upp. cl. phase cl. phase paration paration cl. phase Viscosity pseudo- easily pseudo- slightly pseudo- plastic plastic viscous plastic Particle 5-10 5-10 ap. 10 10-15 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 4 1 3 7 2 dissol. (s)

Detailed Description Paragraph Table (4):

TABLE C Experiment no. 11 12 13 14 15 Component Composition in % Deionized 40.5 40.5 40.5 40.5 40.5 water Ammonium 27.0 27.0 27.0 27.0 27.0 sulphate Glyphosate, 20.3 20.3 20.3 20.3 98% Plantaren 10.2 225 (11) Plantaren 10.2 600 CS (12) Berol 02 10.2 (13) Berol 922 10.2 (14) Pleuriol 10.2 PE6400 (15) Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight 148 148 148 148 148 (g) Density 1.28 1.28 1.28 1.27 1.28 (g/ml) Glyphosate 260 260 260 258 260 (g/l) Amm. 346 346 346 343 346 sulphate (g/l)

Evaluation before storage Appearance foaming 15% lower no se- no se- 15% upp. 10% lower cl. phase paration cl. phase cl. phase Viscosity pseudo- suffici- clearly pseudo- pseudo- plastic ently pseudo- plastic plastic Particle 10-15 app. 10 app. 10 app. 15 app. 15 size (.mu.m) Oil drops n.d. n.d. <25 25-100 >100 (.mu.m) Evaluation after storage at various temperatures Appearance 5% inner 20% upp. 10% upp. 15% upp. 30% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity suffici- suffici- suffici- easily easily ently ently ently Particle 10-15 10-15 5-10 app. 15 app. 15 size (.mu.m) Oil drops n.d n.d. n.d. n.d. n.d. (.mu.m) Speed of 46 12 2 6 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance no se- 20% upp. no se- no se- no se- paration cl. phase paration paration paration Viscosity pseudo- suffici- viscous* pseudo- pseudo- plastic ently plastic plastic Particle 10-15 10-15 5-10 app. 15 app. 15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) n.d. n.d. n.d. (.mu.m) Speed of 25 14 23 6 4 dissol. (s) *screw cap leaky, crystals from the liquid observed.

Detailed Description Paragraph Table (5):

TABLE D Experiment no. 16 17 18 19 20 Component Composition in % Deionized 40.5 40.8

40.8 40.5 40.5 water Ammonium 27.0 27.2 27.2 27.0 27.0 sulphate Glyphosate, 20.3
 20.4 20.4 20.3 20.3 98% Ethoquad 10.2 C/25 (6) Arkopon T 10.2 hockonc. (17) Berol
 987 10.2 (18) Surfadon LP 10.2 300 (19) Aerosil R 1.4 972 (20) Attagel (5) 2.0 1.4
 2.0 2.0 Total weight 148 147 147 148 148 (g) Density 1.26 1.26 1.28 1.27 1.26 (g/ml)
Glyphosate 256 257 261 258 256 (g/l) Amm. 340 343 348 343 340 sulphate (g/l)
 Evaluation before storage Appearance no se- no se- 10% lower no se- no se- paration
 paration cl. phase paration paration Viscosity slightly pseudo- pseudo- pseudo-
 pseudo- viscous plastic plastic plastic plastic Particle app. 10 10-15 app. 10 app.
 10 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d. <25 n.d. (.mu.m) Speed of 25-100
 25-100 n.d. 25-100 <25 dissol. (s) Evaluation after storage at various temperatures
 Appearance 10% upp. 30% upp. 15% lower no se- no se- cl. phase cl. phase cl. phase
 paration paration Viscosity suffi- pseudo- pseudo- pseudo- pseudo- ently plastic
 plastic plastic plastic Particle 5-10 app. 10 app. 10 app. 10 app. 10 size (.mu.m)
 Oil drops n.d. n.d. n.d. <25 n.d. (.mu.m) Speed of 3 3 14 2 13 dissol. (s) Evaluation
 after storage 14 days at 55.degree. C. Appearance no se- 10% upp. no se- no se- no
 se- paration cl. phase paration paration Viscosity slightly pseudo-
 slightly pseudo- some viscous plastic viscous plastic viscous Particle 5-10 10-15
 5-10 10-15 5-10 size (.mu.m) Oil drops n.d. n.d. n.d. 25-100 n.d. (.mu.m) Speed of 5
 2 19 4 20 dissol. (s)

Detailed Description Paragraph Table (6):

TABLE E Experiment no. 21 22 23 24 25 Component Composition in % Deionized 40.5 41.4
 40.0 38.7 38.2 water Ammonium 27.0 27.6 26.7 25.8 25.5 sulphate Glyphosate, 20.3
 20.7 20.0 19.4 19.1 98% Berol OX 10.2 10.3 13.3 16.1 15.9 45-11 (21) Attagel (5) 2.0
 1.3 Total weight 148 145 150 155 157 (g) Density 1.26 1.26 1.26 1.25 1.25 (g/ml)
Glyphosate 256 261 252 243 239 (g/l) Ammonium 340 348 337 323 319 sulphate (g/l)
 Evaluation before storage Appearance no se- 15% lower 15% lower 15% lower 10% lower
 paration cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- easily easily
 easily slightly plastic viscous Particle app. 15 10-15 app. 15 10-15 app. 10 size
 (.mu.m) Oil drops <25 25-100 <25 25-100 25-100 (.mu.m) Evaluation after storage at
 various temperatures Appearance 5% upp. 35% upp. 30% inner 20% lower 5% inner cl.
 phase cl. phase cl. phase cl. phase Viscosity clearly very ea- easily
 suffi- pseudo- pseudo- sily ently plastic plastic Particle 10-15 10-15 10-15 10-15
 app. 10 size (.mu.m) Oil drops <25 n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 2 2 2 3
 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance no se- 30%
 upp. 15% inner 15% lower 10% lower paration cl. phase cl. phase cl. phase cl. phase
 Viscosity clearly very ea- easily suffi- pseudo- pseudo- sily ently plastic
 plastic Particle 10-15 10-15 app. 15 10-15 10-15 size (.mu.m) Oil drops <25 n.d.
 25-100 n.d. 25-100 (.mu.m) Speed of 10 1 1 2 3 dissol. (s)

Detailed Description Paragraph Table (7):

TABLE F Experiment no 26 27 28 29 30 Component Composition in % Deionized water 40.8
 40.5 40.9 47.2 40.5 Ammonium sulphate 27.2 27.0 27.3 20.3 27.0 Glyphosate, 98% 20.4
 20.3 20.5 20.3 20.3 Marlupal 1618/25 (22) 10.2 Radiasurf 7417 (23) 10.2 Berol OX
 45-11 (21) 10.3 10.2 Berol 533 (24) 10.2 Aerosil R 972 (20) 1.0 Attagel (5) 1.4 2.0
 2.0 2.1 Total weight (g) 147 148 146.5 148 148 Density (g/ml) 1.27 1.28 1.26 1.22
 1.26 Glyphosate (g/l) 345 346 258 248 256 Ammonium sulphate 259 260 344 248 340
 (g/l) Evaluation before storage Appearance no separation no separation no separation
 no separation no separation Viscosity slightly slightly pseudo- pseudo- pseudo-
 viscous viscous plastic plastic plastic Particle size (.mu.m) app. 15 app. 15 app.
 10 app. 15 app. 15 Oil drops (.mu.m) n.d. 25-100 25-100 25-100 <25 Evaluation after
 storage at various temperatures Appearance 10% upp. 15% upp. 30% upp. 30% upp. 15%
 upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity clearly pseudo-
 pseudo- pseudo- suffi- pseudo- plastic plastic plastic ently plastic Particle size
 (.mu.m) 10-15 app. 10 app. 10 10-15 app. 10 Oil drops (.mu.m) n.d. n.d. 25-100 n.d.
 n.d. Speed of dissol. (s) 2 2 2 2 3 Evaluation after storage 14 days at 55.degree.
 C. Appearance no separation no separation no separation 20% upp. no separation cl.
 phase Viscosity slightly pseudo- pseudo- easily viscous* viscous plastic plastic
 Particle size (.mu.m) 10-15 app. 10 app. 10 app. 15 app. 10 Oil drops (.mu.m) n.d.
 n.d. n.d. n.d. n.d. Speed of dissol. (s) 7 3 2 2 17 *Screw cap leaky, crystals from
 the liquid observed.

Detailed Description Paragraph Table (8):

TABLE G Experiment no. 31 32 33 34 35 Component Composition in % Deionized 27.4 34.0
 40.5 36.9 33.1 water Ammonium 41.1 17.0 sulfamate Ammonium 17.0 24.6 22.1 sulphate

TABLE J Experiment no. 46 47 48 49 Component Composition in % Deionized water 38.0
38.0 40.5 57.6 Ammonium sulphate 25.3 25.3 27.0 14.3 Glyphosate, 98% 19.0 19.0 30.5
25.2 Berol 02 (13) 6.3 6.3 Hydropar 19 (25) 9.5 Radia 7131 (26) 9.5 Attagel 1.9 1.9

2.0 2.9 Total weight (g) 158 158 148 139 Density (g/ml) 1.22 1.21 1.34 1.22
Glyphosate (g/l) 232 230 409 174 Ammonium sulphate 309 306 362 307 (g/l) Evaluation
 before storage Appearance 10% lower 15% lower no se- 10% upp. cl. phase cl. phase
 paration cl. phase Viscosity suffici- suffici- pseudo- easily ently ently plastic
 Particle size (.mu.m) app. 20 app. 15 10-15 20-25 Oil drops (.mu.m) >100 25-100 n.d.
 n.d. Evaluation after storage at various temperatures Appearance 30% 2 30% lower 10%
 upp. 10% upp. upp. cl. cl. phase cl. phase cl. phase phases Viscosity suffici-
 pseudo- pseudo- easily ently plastic plastic Particle size (.mu.m) app. 15 10-15
 10-15 20-25 Oil drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 2 2 2 22
 Evaluation after storage 14 days at 55.degree. C. Appearance 15% lower 20% lower no
 se- no se- cl. phase cl. phase paration paration Viscosity suffici- pseudo- pseudo-
 easily ently plastic plastic Particle size (.mu.m) app. 15 app. 15 10-15 20-25 Oil
 drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 4 5 2 4

Detailed Description Paragraph Table (12):

TABLE K Experiment no. 50 51 Component Composition in % Deionized water 42.8 41.7
 Ammonium sulphate 28.6 27.8 Moussex 904 SE (28) 0.7 Ethoquad C/25 (6) 25.0 Berol OX
 45-11 (21) 27.8 Attagel 40 (5) 3.6 2.0 Total weight (g) 140 144 Density (g/ml) 1.15
 1.14 Glyphosate (g/l) -- -- Ammonium sulphate (g/l) 329 317 Evaluation before
 storage Appearance 10% lower 10% lower cl. phase cl. phase Viscosity sufficiently
 sufficiently Particle size (.mu.m) -- -- Oil drops (.mu.m) >100 25-100 Evaluation
 after storage at various temperature Appearance 30% lower 25% lower cl. phase cl.
 phase Viscosity sufficiently sufficiently Particle size (.mu.m) -- -- Oil drops
 (.mu.m) n.d. n.d. Evaluation after storage 14 days at 55.degree. C. Appearance 10%
 lower 5% lower cl. phase cl. phase Viscosity sufficiently sufficiently Particle size
 (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d.

Detailed Description Paragraph Table (15):

TABLE N Experiment no. 59 60 61 62 Component Composition in g Deionized water 60.0
 30.0 30.0 Ammonium sulphate 40.0 20.0 40.0 40.0 Propylene glycol 30.0 30.0 60.0
Glyphosate, 98% 30.0 30.0 30.0 30.0 Genapol OX 130 (30) 20.0 20.0 20.0 20.0
 Viscosity Brook- 1800 3100 -- -- field at 20.degree. C. mPaxs mPaxs

Current US Original Classification (1):

504/206

Other Reference Publication (1):

STN International, Chemical Abstracts, vol. 119, No. 9, "Herbicide glyphosate salt
 concentrate", Aug. 30, 1993.

CLAIMS:

1. A concentrated herbicide suspension composition comprising:

5-58% by weight of at least one herbicide, said herbicide being in particulate form
 suspended in a liquid aqueous phase and comprising at least one amino group, at
 least one carboxylic acid group and at least one phosphor containing acid group, and

at least 5% by weight of an electrolyte, which is dissolved in the liquid, aqueous
 phase and which is not a surfactant, and

1-5% by weight of one or more surfactants being emulsified, suspended and/or
 dissolved in the liquid, aqueous electrolyte solution.

5. A composition according to claim 1, wherein the herbicide is glyphosate,
 glufosinate, bilanafos and/or glyphosine.

7. A composition according to claim 1, wherein the herbicide is glyphosate,
 glufosinate, bilanafos and/or glyphosine in its free, non-neutralized form or
 completely or partly converted into its respective ammonium salt by reaction with
 ammonia.

18. A composition according to claim 1, having 3 to 38% by weight of surfactant.

19. A composition according to claim 1, comprising at least one surfactant selected from the group consisting of a non-ionic surfactant.
20. A composition according to claim 19, wherein the non-ionic surfactant is ethoxylated, propoxylated or co-ethoxylated/-propoxylated.
21. A composition according to claim 19, wherein the non-ionic surfactant is a member selected from the group consisting of an alkylglycoside, an alkylpolyglycoside, an alkoxyated alkylglycoside, an alkoxyated alkylpolyglycoside, an alkoxyated saccharide, an alkoxyated polysaccharide, an alkoxyated acetylene diol containing a symmetrically substituted triple bond or an ethoxylated polymethylsiloxane.
22. A composition according to claim 1, which comprises a cationic surfactant selected from the group consisting of C.sub.8-30 -hydrocarbylamine and -diamine and -triamine being alkoxyated with at least 1 oxyethylene and/or oxypropylene group, a quaternary amine with at least one C.sub.8-30 -hydrocarbyl and/or hydrocarbylene group and an alkoxyated derivative thereof, and an amine modified polymethylsiloxane.
23. A composition according to claim 1, which comprises an anionic surfactant selected from the group consisting of a phosphate ester, a sulfonic acid, an ester and halfester of sulfosuccinic acid, a monosulfate ester of C.sub.8-20 -hydrocarbyl alcohol and a steryl alcohol derivative, a naphthalene sulfonic acid derivative, a sulfonated vegetable oil and a sulfonated mono- and diester of a natural fatty acid, a tauride and a sarkoside and a sulfamido carbonic acid and an anionic derivative of a polymethylsiloxane.
25. An activating additive (adjuvant) in concentrated form for admixture with compositions containing glyphosate- and/or glufosinate for combating weeds, said additive comprising at least one surfactant in an amount of 4-58% by weight being emulsified, suspended and/or dissolved in a liquid, aqueous phase, and at least one undissolved, fine-grained, not biologically active, viscosity regulating filler, said filler acting to prevent the separation of the surfactant and being present in an amount of at least 0.3% by weight, characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of at least 5% by weight.

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TITLE: Liquid agricultural chemical composition

Abstract Text (1):

A liquid agricultural chemical composition which is excellent in liquid stability even though it contains an agricultural chemical at a high concentration comprises (a) a water-soluble agricultural chemical, (b) a cationic surfactant represented by formula (I), and (c) an acid salt of a compound represented by formula (II): ##STR1## wherein R.sup.1 represents an alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, each A⁰ represents an oxyethylene group or an oxypropylene group, each of p and q is a number of 1 to 15 with the proviso that the total of p and q is from 2 to 25, and X.sup.- represents a counter ion; and ##STR2## where R.sup.3 represents an alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 represent each a hydrogen atom, a methyl group, or an ethyl group.

Brief Summary Text (7):

It has been attempted to use an inorganic salt(s) as a component of a liquid agricultural chemical formulation, together with a surfactant(s) etc., for the purpose of enhancing the activities of agricultural chemicals. However, in such a liquid agricultural chemical formulation, the chemical interaction between the agricultural chemical or the surfactant and the inorganic salt occurs, thereby salting out the agricultural chemical or the surfactant in some cases. Thus, it has been difficult to prepare a uniform and stable liquid formulation containing an inorganic salt.

Brief Summary Text (8):

An aqueous herbicide composition, which is free from such a problem, in other words, suffers from no salting out, and is stable, is disclosed in Japanese Patent Publication-B No. 7-2608 (published on Jan. 18, 1995) and European Patent Publication-A No. 274,369 (published on Jul. 13, 1988) corresponding thereto. These patent documents describe a composition comprising a water-soluble Glyphosate salt as an agricultural chemical, a quaternary ammonium salt as a surfactant and ammonium sulfate as an inorganic salt, and that the composition of this combination is stable. However, this composition is still insufficient from the viewpoint of the concentration of the agricultural chemical, and salting out occurs in cases when both the inorganic salt and the agricultural chemical are contained in large amounts.

Brief Summary Text (14):

The present inventors have extensively studied to attain the above-mentioned objects. As a result of the studies, they have found that a liquid agricultural chemical composition which contains an agricultural chemical at a high concentration and which is excellent in stability, can be prepared by using an agricultural chemical, a specific cationic surfactant having the excellent effect of enhancing the efficacy of the agricultural chemical, and a specific acid salt of an amine salt. Further, they have found that even when such the agricultural chemical composition also contains an inorganic salt, the stability thereof can also be retained. The present invention has been completed on the basis of these findings.

Brief Summary Text (15):

Thus, the first embodiment of the present invention is a liquid agricultural chemical composition (i) comprising (a) a water-soluble agricultural chemical, (b) a cationic surfactant represented by formula (I), and (c) an acid salt of a compound represented by formula (II): ##STR3## wherein R.sup.1 represents a straight-chain or branched, alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, p and q each means an average value and is a number of 1 to 15 with the proviso that the total of p and q is from 2 to 25, and X.sup.- represents a counter ion; and ##STR4## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

Brief Summary Text (17):

Further, the second embodiment of the present invention is directed to a liquid agricultural chemical composition (ii) comprising (a) a water-soluble agricultural chemical, (b') a cationic surfactant represented by formula (I-a), (c) an acid salt of a compound represented by formula (II), and (d) a water-soluble inorganic salt: ##STR5## wherein R.sup.1 represents a straight-chain or branched, alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, a and b each means an average value and is a number of 1 to 10 with the proviso that the total of a and b is from 2 to 15, and X.sup.- represents a counter ion; and ##STR6## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

Brief Summary Text (22):

Furthermore, the third embodiment of the present invention is a method for converting a composition (1) comprising (a) a water-soluble agricultural chemical and (b) a cationic surfactant represented by the above formula (I) into a stable liquid, which comprises adding (c) an acid salt of a compound represented by the above formula (II) to the composition (1).

Brief Summary Text (23):

In addition, the fourth embodiment of the present invention is a method for converting a composition (2) comprising (a) a water-soluble agricultural chemical, (b') a cationic surfactant represented by the above formula (I-a) and (d) a water-soluble inorganic salt into a stable liquid, which comprises adding (c) an acid salt of a compound represented by the above formula (II) to the composition (2).

Brief Summary Text (24):

The fifth embodiment of the present invention is an adjuvant composition for agricultural chemicals comprising (b) a cationic surfactant represented by the above formula (I), and (c) an acid salt of a compound represented by the above formula (II).

Brief Summary Text (25):

The sixth embodiment of the present invention is an adjuvant composition for agricultural chemicals comprising (b') a cationic surfactant represented by the above formula (I-a), (c) an acid salt of a compound represented by the above formula (II), and (d) a water-soluble inorganic salt.

Brief Summary Text (34):

Examples of herbicides include dipyridyl herbicides, diazine herbicides, benzoic acid herbicides, phenoxy herbicides, organophosphorus herbicides and aliphatic herbicides. Specific examples of the dipyridyl herbicides include Paraquat (1,1'-dimethyl-4,4'-bipyridinium dichloride) and Diquat (6,7-dihydrodipyrido[1,2-a:2',1'-c]pyrazinedium dibromide). Specific examples of the diazine herbicides include Bentazon (3-isopropyl-3H-2,1,3-benzothiadiazin-4-one-2,2-dioxide) and salts thereof (e.g., its sodium salt). Specific examples of the benzoic acid herbicides include MDBA (dicamba) (3,6-dichloro-2-methoxybenzoic acid dimethylamine salt) and

- Imazapyr [isopropylammonium (RS)-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinate]. Specific examples of the phenoxy herbicides include 2,4-D sodium salt (sodium 2,4-dichlorophenoxyacetate), MCP (2-methyl-4-chlorophenoxyacetic acid) and salts thereof (e.g., its sodium salt). MCPP [d,l-2-(4-chloro-o-tolyloxy)propionic acid] and salts thereof (e.g., its potassium salt), and Triclopyr (3,5,6-trichloro-2-pyridyloxyacetic acid) and salts thereof (e.g., its triethylamine salt). Specific examples of the organophosphorus herbicides include Glyphosate [N-(phosphonomethyl)glycine] and water-soluble salts thereof, Bialophos [sodium salt of L-2-amino-4-[(hydroxy) (methyl)phosphinoyl]butyryl-L-alanyl-L-alanine] and Glufosinate (ammonium DL-homoalanin-4-yl(methyl)phosphinate). Further, a specific example of the aliphatic herbicides includes Tetrapione (sodium 2,2,3,3-tetrafluoropropionate).

Brief Summary Text (36):

Herbicides are preferred as the agricultural chemicals to be used in the agricultural chemical composition of the present invention. Among the herbicides described above, organophosphorus herbicides, in particular, Glyphosate [N-(phosphonomethyl)glycine] and water-soluble salts thereof, Bialophos [sodium salt of L-2-amino-4-[(hydroxy) (methyl)phosphinoyl]butyryl-L-alanyl-L-alanine] and Glufosinate [ammonium DL-homoalanin-4-yl(methyl)phosphinate] are preferred.

Brief Summary Text (38):

The agricultural chemical composition, and the adjuvant composition for agricultural chemicals of the present invention contains the cationic surfactant represented by the above formula (I) [i.e., component (b)]. Such a cationic surfactant exerts the excellent effect of enhancing the efficacy of the agricultural chemical.

Brief Summary Text (40):

When the agricultural chemical composition and the adjuvant composition for agricultural chemicals of the present invention contains component (d), as will be described hereinafter, use is made of the cationic surfactant represented by the above formula (I-a) [i.e., component (b')] instead of component (b).

Brief Summary Text (43):

When employed together with an agricultural chemical, the cationic surfactants represented by the above formulae (I) and (I-a) according to the present invention can enhance the efficacy of the agricultural chemical.

Brief Summary Text (63):

The agricultural chemical composition of the present invention may further contain a surfactant other than components (b) and (b'). Examples of the surfactants capable of being used with component (b) or (b') include nonionic surfactants.

Brief Summary Text (64):

Specific examples of the nonionic surfactants include polyoxyethylene alkyl ethers, polyoxyethylene alkyl aryl ethers, condensates of polyoxyethylene alkyl aryl ethers and formaldehyde, polyoxyalkylene aryl ethers, polyoxyalkylene alkyl esters, polyoxyalkylene alkyl sorbitol esters, polyoxyalkylene sorbitan esters, polyoxyalkylene alkyl glycerol esters, polyoxyalkylene block copolymers, esters of polyoxyalkylene block copolymers and alkyl glycerols, polyoxyalkylene alkyl sulfonamides, polyoxyalkylene rosin esters, polyoxypropylene block copolymers, polyoxyethylene oleyl ethers, polyoxyalkylene alkyl phenols, alkyl glycosides, alkyl polyglycosides and polyoxyalkylene alkyl polyglycosides, and one of them or a mixture of two or more of them is used in the present invention.

Brief Summary Text (65):

When these nonionic surfactants are also used, the amount thereof is such that the weight ratio of component (b) or (b') to the nonionic surfactant is in the range of preferably from 9.1/0.9 to 0.9/9.1, and still more preferably from 8.3/1.7 to 5/5.

Brief Summary Text (78):

Examples of the aromatic and aliphatic carboxylic acid chelating agents to be used in the present invention include oxalic acid, succinic acid, pyruvic acid and anthranilic acid, and salts thereof. Further, examples of the amino acid chelating

[illegible]

A

Detailed Description Paragraph Table (4):

Invention	Comparative	Invention	Comparative	product 9	product 9	product 10	product 10
10							

5. A liquid agricultural chemical composition comprising (a) a water-soluble agricultural chemical, (b') a cationic surfactant represented by formula (I-a), (c) an acid salt of a compound represented by formula (II), and (d) a water-soluble inorganic salt: ##STR12## wherein R.sup.1 represents a straight-chain or branched, alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an alkyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, a and b each means an average value and is a number of 1 to 10 with the proviso that the

total of a and b is from 2 to 15, and X.sup.- represents a counter ion; and ##STR13## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

9. A method for converting a composition (1) comprising (a) a water-soluble agricultural chemical and (b) a cationic surfactant represented by formula (I) into a stable liquid, which comprises adding (c) an acid salt of a compound represented by formula (II) to composition (1): ##STR14## wherein R.sup.1 represents a straight-chain or branched alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, p and q each means an average value and is a number of 1 to 15 with the proviso that the total of p and q is from 2 to 25, and X.sup.- represents a counter ion; and ##STR15## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

10. A method for converting a composition (2) comprising (a) a water-soluble agricultural chemical, (b') a cationic surfactant represented by formula (I-a) and (d) a water-soluble inorganic salt into a stable liquid, which comprises adding (c) an acid salt of a compound represented by formula (II) to composition (2): ##STR16## wherein R.sup.1 represents a straight-chain or branched, alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, a and b each means an average value and is a number of 1 to 10 with the proviso that the total of a and b is from 2 to 15, and X.sup.- represents a counter ion; and ##STR17## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

11. An adjuvant composition for agricultural chemicals comprising (b) a cationic surfactant represented by formula (I) and (c) an acid salt of a compound represented by formula (II): ##STR18## wherein R.sup.1 represents a straight-chain or branched, alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, p and q each means an average value and is a number of 1 to 15 with the proviso that the total of p and q is from 2 to 25, and X.sup.- represents a counter ion; and ##STR19## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

12. An adjuvant composition for agricultural chemicals comprising (b') a cationic surfactant represented by formula (I-a), (c) an acid salt of a compound represented by formula (II) and (d) a water-soluble inorganic salt: ##STR20## wherein R.sup.1 represents a straight-chain or branched, alkyl or alkenyl group having 6 to 30 carbon atoms, R.sup.2 represents a hydrogen atom, a methyl group or an ethyl group, AO may be the same or different from one another and each represents an oxyethylene group or an oxypropylene group, a and b each means an average value and is a number of 1 to 10 with the proviso that the total of a and b is from 2 to 15, and X.sup.- represents a counter ion; and ##STR21## wherein R.sup.3 represents a straight-chain or branched, alkyl or alkenyl group having 4 to 18 carbon atoms, and R.sup.4 and R.sup.5 may be the same or different from each other and each represents a hydrogen atom, a methyl group or an ethyl group.

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File: USPT

Dec 28, 1999

DOCUMENT-IDENTIFIER: US 6008158 A

TITLE: Enhancer composition for agricultural chemicals and method for enhancing the efficacy of agricultural chemical

Brief Summary Text (6):

As substances capable of enhancing the efficacies of agricultural chemicals, surfactants comprising various nitrogen-containing compounds such as quaternary ammonium salts, betaines and amine oxides have been known. It is known that quaternized or further polyoxyethylenated long-chain amines, among the above-mentioned compounds, are effective for this purpose. However, the effects of the above described compounds capable of enhancing the efficacies of agricultural chemicals are not always satisfactory.

Brief Summary Text (58):

The present invention provides an enhancer composition for agricultural chemicals comprising an enhancer for agricultural chemicals represented by the above formulas (I) or (II), and a surfactant other than the enhancer for agricultural chemicals; and an enhancer composition for agricultural chemicals comprising an enhancer for agricultural chemicals represented by the above formulas (I) or (II), and a chelating agent.

Brief Summary Text (64):

In the practice of the method of the present invention, it is preferred to, further, use a surfactant other than the enhancer for agricultural chemicals at a weight ratio of the enhancer for agricultural chemicals to the surfactant of 1/10 to 50/1.

Brief Summary Text (96):

When one of the compounds represented by the formulas (I) and (II) or a mixture of at least two of them is used together with a surfactant other than the compounds represented by the formulas (I) and (II), the amount of the compound represented by the formulas (I) or (II) to be used can be reduced without lowering the enhancing effect of the compound represented by the formulas (I) or (II) on agricultural chemicals. That is, the present invention also relates to an enhancer composition for agricultural chemicals comprising at least one of compounds represented by the formulas (I) and (II) or a mixture of at least two of them, and a surfactant other than these compounds.

Brief Summary Text (97):

The surfactant to be used in the enhancer composition for agricultural chemicals according to the present invention may be any of a nonionic surfactant, an anionic surfactant, a cationic surfactant and an amphoteric surfactant, or a mixture of two or more of them.

Brief Summary Text (98):

Examples of the nonionic surfactants include polyoxyethylene alkyl ethers, polyoxyethylene alkylaryl ethers, polyoxyethylene alkylaryl ether/formaldehyde condensates, polyoxyalkylene aryl ethers, polyoxyalkylene alkyl esters, polyoxyalkylene alkylsorbitol esters, polyoxyalkylene sorbitan esters, polyoxyalkylene alkylglycerol esters, polyoxyalkylene block copolymers, polyoxyalkylene block copolymer/alkylglycerol esters, polyoxyalkylene alkylsulfonamides, polyoxyalkylene rosin esters, polyoxypropylene block copolymers, polyoxyethylene oleyl ethers, polyoxyalkylene alkylphenols, alkylglycosides,

alkylpolyglycosides and polyoxyalkylene alkylpolyglycosides. They may be used singly, or in the form of a mixture comprising at least two of these surfactants.

Brief Summary Text (99):

Examples of the cationic surfactants include alkylamine/ethylene oxide adducts and alkylamine/propylene oxide adducts, e.g., tallow amine/ethylene oxide adduct, oleylamine/ethylene oxide adduct, soy amine/ethylene oxide adduct, coco amine/ethylene oxide adduct, synthetic alkylamine/ethylene oxide adducts and octylamine/ethylene oxide adduct; and quaternary ammonium compounds derived from these compounds. They may be used singly, or in the form of a mixture comprising at least two of these surfactants.

Brief Summary Text (100):

Among anionic surfactants, typical ones are available in the form of an aqueous solution or a solid. Examples thereof include sodium mono- and dialkyl naphthalenesulfonates, sodium .alpha.-olefinsulfonate, sodium alkanesulfonates, alkylsulfosuccinates, alkylsulfates, polyoxyalkylene alkyl ether sulfates, polyoxyalkylene alkyl aryl ether sulfates, polyoxyalkylene styryl phenyl ether sulfates, mono- and dialkyl benzenesulfonates, alkyl naphthalenesulfonates, alkyl naphthalenesulfonate/formaldehyde condensates, alkyl diphenyl ether sulfonates, olefinic sulfonates, mono- and dialkyl phosphates, polyoxyalkylene mono- and dialkyl phosphates, polyoxyalkylene mono- and diphenyl ether phosphates, polycarboxylic acid salts, linear and branched alkyl polyoxyalkylene ether acetic acids and salts thereof, linear and branched alkenyl polyoxyalkylene ether acetic acids and salts thereof, linear and branched alkylamido polyoxyalkylene ether acetic acids and salts thereof, fatty acids, such as caprylic acid, lauric acid, stearic acid and oleic acid, and salts thereof, and N-methyl fatty acid taurides. The salt in the above examples refers a sodium salt, a potassium salt, an ammonium salt, an amine salt or the like. They may be used singly, or in the form of a mixture comprising at least two of these surfactants.

Brief Summary Text (101):

Examples of the amphoteric surfactants include lauryldimethylamine oxide, Aromox.RTM. C/12, Monaterics.RTM., Miranols.RTM., Lonzaines.RTM., and other amine oxides and betaine compounds. They may be used singly, or in the form of a mixture comprising at least two of these surfactants.

Brief Summary Text (102):

Among these surfactants, nonionic surfactants and anionic surfactants are particularly preferred.

Brief Summary Text (103):

In the enhancer composition for agricultural chemicals comprising a compound represented by the above formulas (I) or (II), or a mixture of at least two compounds of them, and a surfactant other than these compounds, the weight ratio of the compound represented by the formulas (I) or (II) (the sum total when at least two compounds are used) to the surfactant is preferably from 1/10 to 50/1, still more preferably from 1/1 to 10/1.

Brief Summary Text (117):

Examples of the aromatic and alipatic carboxylic acid chelating agents to be used in the present invention include oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, itaconic acid, aconitic acid, pyruvic acid, salicylic acid, acetylsalicylic acid, hydroxybenzoic acid, aminobenzoic acid (including anthranilic acid), phthalic acid, trimellitic acid and gallic acid, and salts, methyl esters and ethyl esters thereof. Further, examples of the amino acid chelating agents to be used in the present invention include glycine, serine, alanine, lysine, cystine, cysteine, ethionine, tyrosine and methionine, and salts and derivatives thereof.

Brief Summary Text (124):

It has been a practice in the prior art that a small amount of a chelating agent is added to a surfactant capable for enhancing the efficacy of an agricultural chemical [see Japanese Patent Publication-A Nos. 2-295907 (published on Dec. 6, 1990), 4-502618 (published on May 14, 1992) and 56-135409 (published on Oct. 22, 1981)].

However, the main purpose of the addition of a chelating agent according to the prior art is to trap inhibitors against an agricultural chemical i.e., trace metal ions (such as Ca.sup.++ and Mg.sup.++) contained in the water used in diluting the agricultural chemical to convert the hard water into soft water. Accordingly, the amount of the chelating agent added in the prior art is small, while in the present invention, a chelating agent is used in an increased amount as compared with that of the prior art.

Brief Summary Text (130):

Among these herbicides, acid amide herbicides, diazine herbicides, nitrile herbicides, dinitroaniline herbicides, benzoic acid herbicides and organophosphorus herbicides are preferably used together with the compound represented by the formulas (I) or (II). The use of an organophosphorus herbicide is still more preferable. Preferable specific examples of the organophosphorus herbicide include Glyphosate [N-(phosphonomethyl)glycine] and salts thereof; Bialaphos [sodium L-2-amino-4-[(hydroxy)(methyl)-phosphinoyl]butyryl-L-alanyl-L-ananinate] and Glyphosinate [ammonium DL-homoalanin-4-yl-(methyl)-phosphinate].

Brief Summary Text (137):

If necessary, the agricultural chemical composition may further contain a chelating agent as described above, a surfactant other than the compounds represented by the formulas (I) and (II), a pH regulator, an inorganic salt, and/or a thickener.

Brief Summary Text (142):

(ii) one which comprises a container containing a composition comprising at least one of compounds represented by the above formulas (I) and (II), and a surfactant other than the compounds, and another container containing an agricultural chemical composition,

Brief Summary Text (143):

(iii) one which comprises a container containing at least one of compounds represented by the above formulas (I) and (II), another container containing at least one surfactant other than the compounds, and another container containing an agricultural chemical composition,

Brief Summary Text (145):

(v) one which comprises a container containing a composition comprising at least one of compounds represented by the above formulas (I) and (II), and a chelating agent, another container containing at least one surfactant other than the compounds, and another container containing an agricultural chemical composition, and

Brief Summary Text (146):

(vi) one which comprises a container containing a composition comprising at least one of compounds represented by the above formulas (I) and (II), at least one surfactant other than the compounds, and a chelating agent, and another container containing an agricultural chemical composition.

Detailed Description Text (9):

Various enhancers for agricultural chemicals, enhancer mixtures for agricultural chemicals and enhancer compositions for agricultural chemicals listed in Tables 4 to 6 were prepared by using compounds listed in Tables 1 to 3 and, if necessary, surfactants and chelating agents listed in Tables 4 to 6.

Detailed Description Text (11):

The enhancers (or enhancer mixtures or enhancer compositions) listed in the Tables 4 to 6 were each dissolved in deionized water to give dilutions having a concentration of 0.05% by weight. Commercially available herbicides, i.e., Roundup.RTM. liquid formulation (containing 41% by weight of isopropylamine salt of glyphosate as the active ingredient), Karmex.RTM. D wettable powder (containing 78.5% by weight of DCMU as the active ingredient), Herbiace.RTM. water-soluble powder (containing 20% by weight of bialaphos as the active ingredient) were each diluted 500-fold with each of the 0.05% by weight dilutions prepared above. Thus, three kinds of agricultural chemical composition were prepared from each enhancer (or each enhancer mixture or each enhancer composition).

Detailed Description Text (25):

The above Examples 1 to 4 show tests whereby the efficacies of the enhancers (and enhancer mixtures and enhancer compositions) for agricultural chemicals of the present invention were compared with those of common tertiary amine compounds and cationic surfactants (comparative products) employed as enhancers for agricultural chemicals.

Detailed Description Text (26):

As Tables 7 to 16 clearly show, the enhancers (and enhancer mixtures and enhancer compositions) for agricultural chemicals according to the present invention exhibited remarkable effects of enhancing the efficacies of the agricultural chemicals, and were practically usable. On the contrary, the comparative products could slightly enhance the efficacies of the agricultural chemicals, but the enhancing effect was not enough for practical use. Accordingly, it can be understood that the enhancers (and enhancer mixtures and enhancer compositions) for agricultural chemicals according to the present invention specifically enhance the efficacies of the agricultural chemicals as compared with the common tertiary amine compounds and cationic surfactants.

Detailed Description Text (28):

The same test as that of the Example 1 was conducted by using Roundup liquid formulation (containing 41% by weight of an active ingredient) as a herbicide and the enhancer compositions Nos. 9, 13 and 21 used in Example 1 each in the amount specified in Tables 17.

Detailed Description Paragraph Table (4):

TABLE 4

No. of enhancer, Compd. mixture thereof or (A) Surfactant (B) and/or (A)/(B)/(C) enhancer compsn. No. chelating agent (C) by wt.

Invtn. 1

(1) -- 100/0/0 product 2 (1) POE(10) nonylphenyl ether 80/20/0 3 (1) POE(20) sorbitan monooleate 80/20/0 4 (2) -- 100/0/0 5 (2) sodium POE(20) lauryl ether sulfate 80/20/0 6 (2) POE(10) nonylphenyl ether 80/20/0 7 (3) -- 8 (3) palm fatty acid ester of POE(10) glycerol 80/20/0 9 (3) *POE(6) sorbitan monooleate/**EDTA-4Na 75/*10/**15 10 (4) -- 100/0/0 11 (4) POE(20) lauryl ether 80/20/0 12 (4) *beef tallow fatty acid ester of POE(20) 70/*15/**15 glycerol/**ETA-OH 13 (5) -- 100/0/0 14 (5) POE(8) oleyl ether 80/20/0 15 (5) POE(20) sorbitan monooleate 80/20/0 16 (6) -- 100/0/0 17 (6) POE(10) oleate 80/20/0 18 (6) decylpolyglycoside 80/20/0 (average degree of polymerization:1.3) 19 (7) -- 100/0/0 20 (7) palm fatty acid ester of POE(18) glycerol 80/20/0 21 (7) *palm fatty acid ester of POE(18) 70/*15/**15 glycerol/**sodium gluconate

note) POE

is an abbreviation of polyoxyethylene and each figure in the parentheses means the average number of ethylene oxide molecules added (the same applies hereinafter).

Detailed Description Paragraph Table (5):

TABLE 5

No. of enhancer, Compd. mixture thereof or (A) Surfactant (B) and/or (A)/(B)/(C) enhancer compsn. No. chelating agent (C) by wt.

Invtn. 22

(8) -- 100/0/0 product 23 (8) POE(7) branched alkyl (C.sub.12 /C.sub.13) ether 80/20/0 24 (8) *POE(7) branched alkyl (C.sub.12 /C.sub.13) 70/*15/**15 ether/**EDTA-4Na 25 (9) -- 100/0/0 26 (9) POE(20) sorbitan monooleate 80/20/0 27 (9) triethanolamine POE(20) lauryl sulfate 80/20/0 28 (10) -- 100/0/0 29 (10) beef tallow fatty acid ester of POE(18) 75/25/0 glycerol 30 (10) *beef tallow fatty acid ester of POE(18) 70/*20/**10 glycerol/**EDTA-4Na 31 (11) -- 100/0/0 32 (11) beef tallow fatty acid ester of POE(18) 80/20/0 glycerol 33 (11) *beef tallow fatty acid ester of POE(18) 70/*20/**10 glycerol/**sodium heptonate 34 (12) -- 100/0/0 35 (12) POE(8) oleyl ether 80/20/0 36 (12) POE(10) oleate 80/20/0 Comp. 37 POE(4) propylamide 100/0/0 product 38 trimethylmonostearylammonium chloride 100/0/0

Detailed Description Paragraph Table (6):

TABLE 6

No. of enhancer, Compd. mixture thereof or (A) Surfactant (B) and/or (A)/(B)/(C)

Invtn. 39

Detailed Description Paragraph Table (7):

Detailed Description Paragraph Table (8):

Detailed Description Paragraph Table (9):

Current US Cross Reference Classification (3):

6. The method for enhancing the efficacy of an agricultural chemical as claimed in claim 1, which further comprises including a surfactant other than the enhancers for agricultural chemicals represented by the formulas (I) and (II) at a weight ratio of the enhancer for agricultural chemicals to the surfactant of 1/10 to 50/1.

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Jan 26, 1999

DOCUMENT-IDENTIFIER: US 5863863 A

TITLE: Liquid enhancer composition for amino acid series herbicides

Abstract Text (1):

A liquid enhancer composition for amino acid series herbicides comprising specific tertiary amine and a derivative thereof, at least one oxalic acid or a salt thereof selected from the group consisting of oxalic acid, potassium oxalate, alkanolamine salts of oxalic acid, and lower alkylamine salts of oxalic acid, wherein the ratio of oxalic acid or the salt thereof is 0.1 to 10 times mole per mole of the nitrogen-containing compound.

Brief Summary Text (3):

The present invention relates to an enhancer composition for agricultural chemicals and an agricultural chemical composition containing the same, more specifically to a liquid enhancer for herbicides having a higher enhancer effect to amino acid series herbicides, which is represented by glyphosate, and an excellent storage stability.

Brief Summary Text (6):

As substances having the effect of enhancing the activities of agricultural chemicals, surfactants comprising various nitrogen-containing compounds such as quaternary ammonium salts, betaines, and amine oxides have so far been known (JP-A-63-145205). It is known as well that among them, quaternized or further polyoxyethylenated long-chain amines are particularly effective (JP-A-4-211002, JP-A-2-295907, and JP-A-63-284106). However, the medicinal efficacy-enhancing effects of these compounds are not necessarily satisfactory, and a further improvement in the effect has been desired. Accordingly, in order to meet such a desire, the present inventors have proposed to use quaternary ammonium salts or tertiary amines or salts thereof in combination with chelating agents, as shown in W095/17817 published in English on Jul. 6, 1995 corresponding to Japanese Patent Application No. 5-337502 filed on Dec. 28, 1993. In addition, W092/12637 published Aug. 6, 1992 discloses a composition comprising glyphosate, an acid acceptor and a surfactant.

Brief Summary Text (9):

Intensive research has been made by the present inventors in order to obtain an enhancer for amino acid series herbicides which has good stability to changes in temperatures even when it is stored in a liquid form over an extended period of time have resulted in finding that the intended liquid enhancer and liquid herbicide composition can be obtained by using a nitrogen-containing compound comprising specific tertiary amine and derivatives thereof in combination with oxalic acid or a specific oxalic acid salt, and thus completing the present invention.

Brief Summary Text (10):

That is, the present invention provides a liquid enhancer composition for amino acid series herbicides characterized by containing (1) at least one nitrogen-containing compound selected from tertiary amines represented by the following Formula (1) and derivatives thereof, and (2) at least one oxalic acid or salt thereof selected from the group consisting of oxalic acid, potassium oxalate, alkanolamine salts of oxalic acid, and lower alkylamine salts of oxalic acid, wherein the content of oxalic acid or a salt thereof is 0.1 to 10 times mole per mole of the nitrogen-containing compound described above: ##STR1## [wherein R^{sup.1} : represents a linear or branched alkyl group having a carbon number of 8 to 30 or a linear or branched

alkenyl group having a carbon number of 8 to 30, and

Brief Summary Text (12):

The invention provides, in other words, a liquid enhancer composition for herbicides of amino acid compounds which comprises, or consisting essentially of, (1) at least one nitrogen-containing compound as above defined and (2) at least one oxalic acid compound as above defined, optionally further comprising a surfactant.

Brief Summary Text (15):

An herbicide composition of the invention comprises (i) an effective amount of at least one nitrogen-containing compound as defined above and an effective amount of the oxalic acid compound as defined above and (ii) a herbicide of amino acid compound, a weight ratio of (i) to (ii) ranging from 0.05/1 to 50/1.

Brief Summary Text (16):

The invention moreover provides a method for enhancing the herbicidal effectiveness of (ii) a herbicide of amino acid compound with (i) an effective amount of at least one nitrogen-containing compound as defined above and an effective amount of the oxalic acid compound as defined above.

Brief Summary Text (48):

In the present invention, the nitrogen-containing compound and oxalic acid or the specific oxalic acid salt as described above are used in combination. The salt of oxalic acid is potassium salt, alkanolamine salt, or lower alkylamine salt. The alkanolamine salt includes monoethanolamine salt, diethanolamine salt, and triethanolamine salt. The lower alkylamine salt includes monomethylamine salt, monoethylamine salt, dimethylamine salt, and diethylamine salt. The liquid enhancer composition which is stable to a change in temperatures can not be obtained from oxalic acid salts other than the above compounds. The oxalic acid salt is preferably potassium salt or alkanolamine salt, particularly preferably potassium salt or diethanolamine salt.

Brief Summary Text (49):

Oxalic acid or the salt thereof is used in a range of 0.1 to 10 moles, preferably 0.3 to 5 moles per mole of the nitrogen-containing compound. If the amount of oxalic acid or the salt thereof is less than 0.1 mole or exceeds 10 moles, the enhancement effect of amino acid series herbicides is deteriorated, and the composition becomes unstable to a change in temperatures.

Brief Summary Text (50):

In the liquid enhancer composition of the present invention, known surfactants can be used in combination.

Brief Summary Text (51):

Nonionic surfactants, anionic surfactants, and amphoteric surfactants, or the mixture thereof can be used as the surfactants capable of being used in combination.

Brief Summary Text (52):

These surfactants can be combined at the weight ratio of 1/1 to 1/10, preferably 1/2 to 1/6 based on the nitrogen-containing compound.

Brief Summary Text (53):

The nonionic surfactants include polyoxyethylene alkyl ether, polyoxyethylene alkylaryl ether, polyoxyethylene alkylaryl ether formaldehyde condensation product, polyoxyalkylene aryl ether, polyoxyalkylene alkyl ester, polyoxyalkylene alkylsorbitol ester, polyoxyalkylene sorbitan ester, polyoxyalkylene alkylglycerol ester, polyoxyalkylene block copolymer, polyoxyalkylene block copolymer alkylglycerol ester, polyoxyalkylene alkylsulfonamide, polyoxyalkylene rosin ester, polyoxypropylene block copolymer, polyoxyethylene oleyl ether, polyoxyalkylene alkylphenol, and the mixture of two or more kinds thereof.

Brief Summary Text (54):

Among the anionic surfactants, typical ones can be obtained in the form of an aqueous solution or a solid matter. The examples thereof include sodium mono- and

di-alkylnaphthalenesulfonates, sodium alpha-olefinsulfonates, sodium alkanesulfonates, alkylsulfosuccinates, alkylsulfates, polyoxyalkylene alkyl ether sulfates, polyoxyalkylene alkylaryl ether sulfates, polyoxyalkylene styrylphenyl ether sulfates, mono- and di-alkylbenzenesulfonates, alkylnaphthalenesulfonates, formaldehyde condensation products of alkylnaphthalenesulfonates, alkyl diphenyl ether sulfonates, olefinic sulfonates, mono- and dialkylphosphates, polyoxyalkylene mono and dialkylphosphates, polyoxyalkylene mono and diphenyl ether phosphates, polyoxyalkylene mono and dialkylphenyl ether phosphates, polycarboxylates, fatty acid salts, linear and branched alkyl polyoxyalkylene ether acetic acid or the salts thereof, alkenyl polyoxyalkylene ether acetic acid or the salts thereof, stearic acid and the salts thereof, oleic acid and the salts thereof, N-methyl fatty acid taurides, and the mixtures of two or more kinds thereof (including sodium, potassium, ammonium and amine salts).

Brief Summary Text (55):

Among these surfactants, particularly preferred are the nonionic surfactants. Of them, preferred are ester types such as polyoxyalkylene sorbitan esters and polyoxyalkylene alkylglycerol esters, polyoxyalkylene alkyl ethers, and polyoxyalkylene alkylphenyl ethers.

Brief Summary Text (56):

The liquid enhancer composition for amino acid series herbicides of the present invention comprises the preceding nitrogen-containing compound, oxalic acid or the salt thereof, optional components blended according to necessity, and the balance of water. The form thereof is usually an aqueous solution. In the present invention, the nitrogen-containing compound is blended into the composition in a proportion of 10 to 30 weight %, preferably 15 to 25 weight %. The mole ratio of the oxalic acid (salt) to the nitrogen-containing compound has to be controlled to the ratio described previously.

Brief Summary Text (58):

The amino acid series herbicide includes, for example, glyphosate (N-(phosphonomethyl)glycine or the salts thereof), bialaphos (sodium salt of L-2-amino-4-[(hydroxy)(methyl)=phosphinoyl]butyryl-L-alanyl-L-alanine), and glufosinate (ammonium-DL-homoalanine-4-yl(methyl)phosphinate).

Brief Summary Text (59):

In the liquid herbicide composition of the present invention, the ratio of the enhancer composition of the present invention to the amino acid series herbicide is (i)/(ii)=0.05 to 50, preferably 0.05 to 20, and more preferably 0.1 to 10 in terms of a weight ratio of the total amount (i) of the nitrogen-containing compound and oxalic acid or the salt thereof contained in the enhancer composition to the agricultural chemical primary component (the active ingredient of the herbicide) (ii) contained in the amino acid series herbicide. The ratio of less than 0.05 can not sufficiently achieve the intended enhancement effect of the herbicide. Meanwhile, the ratio exceeding 50 does not allow further increase in the effect to be expected.

Detailed Description Text (4):

The nitrogen-containing compounds and oxalic acid or the salts thereof shown in Table 1 were used to obtain various liquid enhancer compositions.

Detailed Description Text (7):

BisPOE(15)tallowamine oxide of 20 g was used to prepare the liquid composition of total 100 g so that the mole ratio thereof to oxalic acid (salt) became 1:3, and the composition was evaluated in the same manner.

Detailed Description Text (10):

As shown in Table 2, while the excellent temperature stability was shown when oxalic acid, dipotassium oxalate, diethanolamine oxalate, and dimethylamine oxalate were used, disodium oxalate and diammonium oxalate caused phase separation, cloudiness and precipitates to be deposited after storing at a constant temperature for one month and therefore did not provide the stable liquid enhancer compositions which were allowable in terms of the stability with lapse of time.

		1	
Cocoalkyltrimethylammonium chloride	20 g	<u>Oxalic acid</u>	5.2 g 1:0.75 74.8 g 2
Cocoalkyltrimethylammonium chloride	20 g	<u>Dipotassium oxalate</u>	9.6 g 1:0.75 70.4 g 3
Cocoalkyltrimethylammonium chloride	20 g	<u>Sodium oxalate</u>	7.7 g 1:0.75 72.3 g 4
Cocoalkyltrimethylammonium chloride	20 g	<u>Diammonium oxalate</u>	7.2 g 1:0.75 72.8 g 5
Cocoalkyltrimethylammonium chloride	20 g	<u>Diethanolamine oxalate</u>	17.2 g 1:0.75 62.8 g
6 Cocoalkyltrimethylammonium chloride	20 g	<u>Dimethylamine oxalate</u>	8.6 g 1:0.75 71.4 g
7 POE(15)beef tallow amine	20 g	<u>Oxalic acid</u>	5.2 g 1:3 74.8 g 8 POE(15)beef tallow amine
20 g	<u>Dipotassium oxalate</u>	9.6 g 1:3 70.4 g 9 POE(15)beef tallow amine	20 g
<u>Sodium oxalate</u>	7.7 g 1:3 72.3 g 10 POE(15)beef tallow amine	20 g	<u>Diammonium oxalate</u>
7.2 g 1:3 72.8 g 11 POE(15)beef tallow amine	20 g	<u>Diethanolamine oxalate</u>	17.2 g 1:3 62.8 g 12 POE(15)beef tallow amine
20 g	<u>Dimethylamine oxalate</u>	8.6 g 1:3	

71.4 g 13 POE(15)cocoalkylmonomethyl- 20 g Oxalic acid 5.2 g 1:3 74.8 g ammonium chloride 14 POE(15)cocoalkylmonomethyl- 20 g Dipotassium oxalate 9.6 g 1:3 70.4 g ammonium chloride 15 POE(15)cocoalkylmonomethyl- 20 g Disodium oxalate 7.7 g 1:3 72.3 g ammonium chloride 16 POE(15)cocoalkylmonomethyl- 20 g Diammonium oxalate 7.2 g 1:3 72.8 g ammonium chloride 17 POE(15)cocoalkylmonomethyl- 20 g Diethanolamine oxalate 17.2 g 1:3 62.8 g ammonium chloride 18 POE(15)cocoalkylmonomethyl- 20 g Dimethylamine oxalate 8.6 g 1:3 71.4 g ammonium chloride 19 POE(2)cocoalkylmonomethyl- 16 g ammonium chloride POE(6)Lauryl ether 4 g Dipotassium oxalate 9.6 g 1:1.2 70.4 g Comp. 1 Cocoalkyltrimethylammonium chloride 20 g 80 g Comp. 2 POE(15)beef tallow amine 20 g 80 g Comp. 3 POE(15)cocoalkylmonomethyl- 20 g 80 g ammonium chloride Comp. 4 Dipotassium oxalate 9.6 g 90.4 g Comp. 5 Diethanolamine oxalate 17.2 g 82.8 g

*Mole

ratio . . . nitrogericontaining compound: oxalic acid or salt thereof

Detailed Description Paragraph Table (3):

TABLE 3 Herbicidal rate to crabgrass (%)

Basta	Roundup	Herbie	Enhancer	liquid	liquid	liquid	composi-	formu-	formu-	formu-	tion No.
lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion
86.7	2	90.2	95.6	89.4	3	58.0	62.7	60.0	4	65.2	70.5
89.2	7	90.5	96.7	92.8	8	92.4	98.6	93.8	9	57.2	60.9
94.2	89.2	12	90.0	92.3	86.4	13	92.1	96.5	87.3	14	93.4
68.5	70.2	62.5	17	90.6	93.6	84.2	18	86.4	94.2	86.7	19
60.5	61.5	61.2	Comp.	Ex. 2	59.8	62.4	58.0	Comp.	Ex. 3	60.8	63.5
46.7	54.2	56.0									

Detailed Description Paragraph Table (4):

TABLE 4 Herbicidal rate to cabbage (%) Basta

Roundup	Herbie	Enhancer	liquid	liquid	liquid	composi-	formu-	formu-	formu-	tion No.
lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion	lotion
76.4	70.2	3	45.6	38.9	42.8	4	50.2	40.5	49.6	5
82.1	73.2	8	78.2	80.4	74.6	9	40.2	35.6	38.8	10
72.6	74.2	68.9	13	77.3	80.6	76.1	14	82.2	81.6	15
47.2	17	76.4	79.4	72.4	18	73.2	80.2	69.3	19	81.6
42.1	Comp.	Ex. 2	38.9	33.5	36.4	Comp.	Ex. 3	42.6	40.1	41.8
24.8										

Detailed Description Paragraph Table (5):

TABLE 5 Herbicide Enhancer composition Glyphosate isopropylamine aqueous composition for liquid herbicide solution (active ingredient 70%) Water blend No. No. Blend amount (g) blend amount (g) amount (g)

										(1)	1
37.5	58.6	3.9	(2)	2	37.5	58.6	3.9	(3)	3	37.5	58.6
58.6	3.9	(6)	6	37.5	58.6	3.9	(7)	7	37.5	58.6	3.9
3.9	(10)	10	37.5	58.6	3.9	(11)	11	37.5	58.6	3.9	(12)
58.6	3.9	(14)	14	37.5	58.6	3.9	(15)	15	37.5	58.6	3.9
37.5	58.6	3.9	(18)	18	37.5	58.6	3.9	(19)	19	37.5	58.6
3.9	(21)	Comp.	Ex. 2	37.5	58.6	3.9	(22)	Comp.	Ex. 3	37.5	58.6
37.5	58.6	3.9	(24)	Comp.	Ex. 5	37.5	58.6	3.9			

Detailed Description Paragraph Table (7):

TABLE 7 Herbicide Herbicidal rate Herbicidal rate composition No. to crabgrass (%) to cabbage (%)

										1	93.2	62.4	2	90.2	85.2	3	62.6	33.4	4	64.1
35.1	5	88.5	59.8	6	85.3	61.8	7	92.5	68.4	8	88.7	73.1	9	60.8	31.3	10	65.3	33.3	11	
85.6	70.5	12	87.3	66	13	90.6	71.8	14	93.4	75.3	15	65.3	34.1	16	67.2	35.6	17	86.5		
70.4	18	82.7	68.7	19	91.7	72.1	20	60.5	28.3	21	60.4	29.5	22	61.8	30.4	23	54.6	25.4		
24	58.3	26.3	Roundup	liquid	62.3	30.5	formulation													

Current US Cross Reference Classification (1):

504/206

• Other Reference Publication (2):

Wyrill, J. B. et al "Glyphosate Toxicity to Common Milkweed and Hemp Dogbane as Influenced by Surfactants". Weed Science. 25(3):275-287, May 1977.

Other Reference Publication (3):

Turner, D. J. "Effects on glyphosate performance of formulation, additives and mixing with other herbicides". Chapter 15 of The Herbicide Glyphosate, E. Grossbard et al, ed. Boston:Butterworths. pp. 221-240, 1985.

CLAIMS:

1. An aqueous liquid enhancer composition for herbicides of amino acid compounds which comprises (1) 10 to 30% by weight of at least one nitrogen-containing compound selected from tertiary amine compounds represented by the following Formula (1) and derivatives thereof; and (2) at least one oxalic acid compound selected from the group consisting of oxalic acid, potassium oxalate, alkanolamine salts of oxalic acid, potassium oxalate, alkanolamine salts of oxalic acid and lower alkylamine salts of oxalic acid, at a mole ratio of (2) the oxalic acid compound to (1) the nitrogen-containing compound ranging between 0.1/1 and 10/1: ##STR6## R.sup.1 : represents a linear or branched alkyl group having a carbon number of 8 to 30 or a linear or branched alkenyl group having a carbon number of 8 to 30, and

R.sup.2, R.sup.3 : may be the same or different from each other and each represent a linear or branched alkyl group having a carbon number of 1 to 30, a linear or branched alkenyl group having a carbon number of 2 to 30, or --(AO).sub.n --H wherein AO is an oxyalkylene group having a carbon number of 2 to 4, and n is a number of 1 to 30 on the average.

3. The aqueous liquid enhancer composition as claimed in claim 1, which further comprises a surfactant.

4. An herbicide composition comprising (i) an effective amount of at least one nitrogen-containing compound as defined in claim 1 and an effective amount of the oxalic acid compound as defined in claim 1 and (ii) a herbicide of amino acid compound.

5. The herbicide composition as claimed in claim 4, in which the herbicide is selected from the group consisting of glyphosate (N-(phosphonomethyl)-glycine, salts thereof), bialaphos (sodium salt of L-2-amino-4-[(hydroxy)(methyl)=phosphinoyl]butyryl-L-alanyl-L-alanine) and glufosinate (ammonium-DL-homoalanine-4-yl(methyl)phosphinate).

7. A method for enhancing the herbicidal effectiveness of (ii) a herbicide of an amino acid compound which comprises adding (ii), and (i) an effective amount of at least one nitrogen-containing compound as defined in claim 1 and an effective amount of the oxalic acid compound as defined in claim 1 together to form a composition; and applying said composition to an area to be treated.

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L7: Entry 20 of 28

File: USPT

Jun 11, 1996

DOCUMENT-IDENTIFIER: US 5525576 A

TITLE: Seed hull extract assimilation agents for agrochemical compositions

Brief Summary Text (6):

Surfactants have been commonly used to increase the wetted surface area of the plant's outer surface. The increased area thus increases the absolute amount of applied agent that is absorbed in a unit of time. The most commonly used surfactant for plant growth regulating agents is a product known as ORTHO X-77.TM. containing 70-75% ethoxylated octylphenol, 15% free fatty acids, and 10% isopropanol. It is believed that the isopropanol component of X-77.TM. partially dissolves the waxy outer coating to permit the applied agents to more easily penetrate into the plant tissues. Isopropanol, however, poses certain risks of flammability in use and in product storage.

Detailed Description Text (4):

Acids that can be found in the oxidized extract of the invention include mixtures of succinic acid, malic acid, glycollic acid, glyceric acid, xylonic acid, oxalic acid, malonic acid, adipic acid, and glutaric acid. The polyhydroxycarboxylic acids are related to hydroxyglutaric acid. The carbohydrates in the extract include trioses and hexoses.

Detailed Description Text (14):

The plant growth regulating component of the present invention can include, inter alia: plant growth enhancing amounts of at least one of the 84 identified gibberillins with GA.sub.3, GA.sub.4, GA.sub.5, GA.sub.7 and GA.sub.9 being the preferred gibberillins for use in the present invention, cytokinins (e.g., zeatin, kinetin, benzyladenine, dihydrozeatin, and isopentenyl adenine), auxins (e.g., indoleacetic acid (IAA), indolebutyric acid (IBA), and naphthalenacetic acid (NAA)); sodium ortho-nitrophenolate; sodium para-nitrophenolate; sodium 5-nitro-guaicolate; polyhydroxycarboxylic acids of 2, 4, 5, and 6 carbon structures that are not associated with the Krebs cycle; a growth stunting amount of mepiquat chloride; a lethal amount of either glyphosate or sulfosate; a growth enhancing amount of bacillus subtilis; and a sulfonyl-urea herbicides; and systemic fungicide (e.g., tridemorph).

Detailed Description Text (45):

Sulfosate (Touchdown.TM.) was tested for control over bahiagrass (Paspalum notalium) in a formulation with the commercially available surfactant, ORTHO X-77.TM., and with assimilation agent prepared according to example 1. Bahiagrass is a weed found in citrus groves that is eliminated to conserve water for the citrus fruit. Thus, the speed with which the bahiagrass is controlled is important.

Detailed Description Text (46):

The application rate of the sulfosate in this example was 50% of the suggested label rate for control of bahiagrass, i.e., 1 lb active ingredient per acre (0.11 g/m.sup.2). At this lower application rate the effectiveness of surfactant and assimilation agent can be more readily determined. The surfactant and the assimilation agent were applied at 0.5 vol % and 1 vol % rates.

Detailed Description Text (49):

Examination of the results in Table 6 show that the level of control did not differ between the 0.5% and 1% application rates of each of the X-77.TM. and the present

CLAIMS:

2. A composition in claim 1 wherein said active ingredient is selected from the group consisting of at least one of the gibberillins; sodium ortho-nitrophenolate; sodium para-nitrophenolate; sodium 5-nitro-guaicolate; a growth stunting amount of mepiquat chloride; a lethal amount of either glyphosate or sulfosate; and a sulfonyl-urea herbicide.

10. A method as in claim 6 wherein the applying step comprises applying said assimilation agent and a plant growth regulating agent comprising an active ingredient selected from the group consisting of at least one of the gibberillins; sodium orthonitrophenolate; sodium para-nitrophenolate; sodium 5-nitro-guaicolate; a growth stunting amount of mepiquat chloride; a lethal amount of either glyphosate or sulfosate.

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L7: Entry 21 of 28

File: USPT

May 2, 1995

DOCUMENT-IDENTIFIER: US 5411944 A

**** See image for Certificate of Correction ****TITLE: Glyphosate-sulfuric acid adduct herbicides and useAbstract Text (1):

Herbicidal compositions are provided which contain combinations of glyphosate [N-(phosphonomethyl)glycine] and sulfuric acid, and/or combinations of glyphosate, sulfuric acid and a chalcogen-containing compound of the formula R.sub.1 --CX--R.sub.2 wherein X is a chalcogen compound of the formula R.sub.1 --CX--R.sub.2 wherein X is selected from oxygen and sulfur, R.sub.1 and R.sub.2 are independently selected from hydrogen, monovalent organic radicals, NR.sub.3 R.sub.4 and NR.sub.5, at least one of R.sub.1 and R.sub.2 being NR.sub.3 R.sub.4 or NR.sub.5, R.sub.3 and R.sub.4 are independently selected from hydrogen and monovalent organic radicals, and R.sub.5 is a divalent organic radical. Such compositions contain reaction products of glyphosate and sulfuric acid, and/or of glyphosate, sulfuric acid and the chalcogen compound, and they may also contain excess glyphosate or sulfuric acid. They effect more rapid, more thorough, broader spectrum vegetation control, and are more stable chemically and less toxic than other glyphosate-containing herbicides.

Brief Summary Text (5):

The unique herbicidal properties of glyphosate and several of its more soluble salts are renowned. As reported by Grossbard and Atkinson in "The Herbicide Glyphosate," Butterworths, Boston, 1985, and by J. E. Franz in U.S. Pat. No. 3,799,758, glyphosate is a broad spectrum, nonselective, post-emergent herbicide having high unit activity on a wide variety of both annual and perennial plants. It can be manufactured and applied as glyphosate per se or any one of a very broad variety of glyphosate derivatives and homologues which, according to Franz, include halogen; hydroxy; thio; ammonium; mono- and di-alkylamine; hydroxy-alkyl and alkenyl amine, hydrocarbyl, hydrocarbonoxyhydrocarbyl, halohydrocarbyl, and halo-hydrocarbonoxyhydrocarbyl esters and thioesters; aminohydrocarbyl; metallo-oxy including alkali and alkaline earth, copper, zinc, manganese and nickel-oxy; aminooxy; organic aminooxy; and/or strong acid salt derivatives and homologs. According to Franz, supra, the alkali, alkaline earth, ammonium and organic amine salts are preferred. The isopropylamine salt is marketed by Monsanto Chemical Company as Roundup.RTM..

Brief Summary Text (6):

According to Grossbard et al., supra, when glyphosate is contacted with plant foliage, it is translocated to the plant roots, rhizomes, and apical meristemes giving it its systemic property and resulting in the total destruction of many resistant perennial weeds such as rhizome sorghum halepense, Agropyron repens, Cirsium arvense, Cyprus spp., C. dactylon, and others. Glyphosate, per se, has relatively broad herbicidal utility since it is active on a variety of vegetation. It is systemic, non-persistent, and is readily metabolized by soil microorganisms to form plant nutrients, including phosphoric acid, ammonia, and carbon dioxide. Thus, glyphosate is environmentally attractive in comparison to many alternative herbicides. For these reasons, glyphosate-containing herbicides are marketed in over 100 countries and are used to control undesired vegetation in crop lands, plantations, orchards, industrial and recreational areas, and for home use.

Brief Summary Text (7):

As with all things in nature, however, there is always room for improvement. While glyphosate is a very active, broad spectrum, systemic, relatively environmentally safe herbicide, its solubility in water at 25.degree. C. is only 1.2 weight percent and many of its homologues and salts are only slightly soluble or are essentially insoluble in water and organic solvents. For instance, Franz illustrated that the glyphosate-hydrochloric acid "salt" is essentially insoluble in either water or tetrahydrofuran. Glyphosate is expensive and, when applied at recommended dosages as the isopropylamine salt, it does not completely control all plant species and maximum control does not occur for 1 to 3 weeks depending on plant species, dosage, etc. Moreover, many of the organic amine salts preferred by Franz have negative environmental effects which are not exhibited by the parent compound itself. For instance, the isopropylamine salt is toxic to fish and is not approved, at least not in the United States, for use on aquatic vegetation. The active portion of the molecule in the deliverable (water soluble) compounds--the glyphosate segment--is relatively chemically unstable even in weakly basic environments. Thus, glyphosate is hydrolyzed in weak base which may account for its failure to control vegetation in some instances. Mineral dust which accumulates on vegetation is generally alkaline, and hydrolysis which can occur in that environment (presumably at the amide link in the compound) deactivates glyphosate as a herbicide.

Brief Summary Text (8):

Several investigators have found that the herbicidal activity of glyphosate and its compounds can be increased in certain respects by formulation with other compounds. For instance, Grossbard and Atkinson, supra, report at page 226, that, under suitable conditions, ammonium salts, such as ammonium sulfate, can increase the phytotoxicity of a variety of water-soluble leaf-applied herbicides, including certain water-soluble glyphosate derivatives. According to Grossbard et al., these effects are evident particularly when ammonium salts such as ammonium sulfate are combined with the appropriate surfactant (ibid., page 228). The effects of several other compounds have also been investigated. For instance, Grossbard et al., report, at page 229, that ammonium salts other than ammonium sulfate have shown improved herbicidal effects in isolated studies and that those effects are less than have been observed in other instances with ammonium sulfate. They also report that, in one test on *C. rotundas*, slight improvement in glyphosate activity was observed upon addition of urea to the formulation. Other investigators have studied the relative effects of hydrophilic and lipophilic surfactants in the presence or absence of other components such as ammonium salts (Grossbard et al., ibid., page 228). Polybasic acids such as orthophosphoric and oxalic acids reportedly have shown improvement for the control for *Agropyron repens* when used in combination with certain soluble glyphosate derivatives (Grossbard et al., supra, page 230). While the precise mode of action of the previously tested ammonium salts, surfactants, polybasic acids, and other additives is not known with certainty, it has been suggested that certain ammonium salts modify plant membrane permeability but do not appear to directly influence translocation, while the polybasic acids may improve activity of the isopropylamine salt by sequestering and/or immobilizing metals such as calcium (ibid, page 230). However, the herbicidal effectiveness, per se, of glyphosate compounds and compositions, according to Franz, is not affected by the type of salt, i.e., the glyphosate counter-ion. Thus, in the chapter dealing with the discovery, development, and chemistry of glyphosate published by Grossbard et al., supra, Franz states that "[a]fter penetration into leaf tissue, therefore, glyphosate exists in the apoplast primarily in its monoanionic form and is translocated via the phloem as the dianion. The similar herbicidal effectiveness of glyphosate acid and many of its soluble salts . . . indicates that the counter-ion may influence formulation solubility but not overall biological activity." (Grossbard et al., supra, p. 9)

Brief Summary Text (10):

Briefly, the invention provides novel liquid, water-soluble, herbicidal combinations of glyphosate, or its derivatives, and sulfuric acid and/or combinations of glyphosate, sulfuric acid and chalcogen compounds of the formula R.sub.1 --CX--R.sub.2 where X is oxygen or sulfur; R.sub.1 and R.sub.2 are independently selected from hydrogen, monovalent organic radicals, NR.sub.3 R.sub.4 and NR.sub.5 wherein R.sub.3 and R.sub.4 are independently selected from hydrogen and monovalent organic radicals and R.sub.5 is a divalent organic radical, provided that at least one of R.sub.1 and R.sub.2 is NR.sub.3 R.sub.4 or NR.sub.5. These combinations

contain (or form upon evaporation of solvent) reaction products of glyphosate, or its derivatives, and sulfuric acid and/or of glyphosate, sulfuric acid and the defined chalcogen compounds. The invention also provides novel methods for controlling vegetation with such compositions.

Brief Summary Text (11):

These compositions possess many advantages in comparison to glyphosate and its homologs and derivatives, including the metal and amine salts preferred by Franz, supra, and the commercially available, water soluble organic amine salts (e.g., Roundup). The sulfuric acid-containing combinations are much more soluble than glyphosate, and they are substantially more chemically stable, less toxic, less costly to manufacture, and more active on a wider variety of vegetation than the amine salts such as the isopropylamine salt. The glyphosate-sulfuric acid and glyphosate-sulfuric acid-chalcogen compound compositions may be either solids or liquids, and concentrated liquid systems can be produced which contain only glyphosate and sulfuric acid and which are solvent-free, completely stable at room temperature, and miscible with water or other polar solvents in all proportions. Thus, they eliminate the need for toxic, expensive organic amine derivatives, such as the isopropylamine salt, which can be toxic to the environment and to animals such as fish. Yet they provide concentrated, water-soluble, chemically stable, fast-acting, broad spectrum, non-caustic, herbicidal formulations which easily can be manufactured, shipped, stored and applied. Thus, these compositions and methods reduce the expense and the environmental and health hazards involved in plant control by reducing the cost and toxicity of the herbicidal agent and the quantity of material which must be applied. It also has been found that glyphosate attenuates several properties of sulfuric acid, including its corrosivity.

Brief Summary Text (12):

The novel compositions are faster acting and broader spectrum herbicides, and they provide rapid, thorough control of species not adequately controlled by the organoamine-glyphosate formulations. In effect, they broaden the range of species on which the glyphosate component is active. In particular, the compositions of this invention are more active for the control of broad leaf plants than are other glyphosate-containing formulations. They are also more chemically stable than other compositions containing glyphosate since they minimize the activity loss which otherwise results from hydrolysis of the glyphosate unit under alkaline conditions which may exist on dusty plant foliage, in application equipment, and in water used for dilution.

Brief Summary Text (13):

The chemical stability and apparent potentiation of glyphosate in the novel compositions may be due, in part, to direct potentiation of glyphosate activity by the acid and urea components and to the resistance to base hydrolysis which may be imparted by the sulfuric acid component. While sulfuric acid apparently potentiates glyphosate's herbicidal activity and improves its chemical stability and solubility, the glyphosate component, in effect, tames the acid by attenuating its corrosivity and reactivity to equipment, personnel, and clothing. For instance, while the 1/1 glyphosate/H.sub.2 SO.sub.4 molar ratio reaction product contains 36 weight percent sulfuric acid, it does not immediately burn skin or char clothing as would aqueous solutions containing an equivalent amount of free sulfuric acid.

Brief Summary Text (14):

Due to these and other advantageous characteristics, the glyphosate-sulfuric acid-containing compositions of this invention reduce the expense involved in vegetation control; they are easier to handle, store, ship, and apply. They are less toxic to the environment, and impart less residue in crops due to their higher specific activity.

Detailed Description Text (2):

The herbicidal compositions of this invention involve combinations of sulfuric acid and glyphosate [N-(phosphono-methyl)glycine] and of sulfuric acid, glyphosate, and chalcogen compounds of the formula R.sub.1 --CX--R.sub.2 where X is oxygen or sulfur, R.sub.1 and R.sub.2 are independently selected from hydrogen, monovalent organic radicals, NR.sub.3 R.sub.4 and NR.sub.5 wherein R.sub.3 and R.sub.4 are independently selected from hydrogen and monovalent organic radicals and R.sub.5 is

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L7: Entry 27 of 28

File: USPT

Jul 3, 1979

DOCUMENT-IDENTIFIER: US 4159901 A

TITLE: Corrosion inhibited agricultural compositions

Abstract Text (1):

Corrosion of metal surfaces contacted by aqueous agricultural compositions containing as an active ingredient an aminomethylenephosphonic acid, such as N-phosphonomethylglycine or an agriculturally acceptable salt or ester thereof is inhibited by the inclusion in the compositions of an inhibiting amount of a thiol compound or salt thereof.

Brief Summary Text (3):

The term "agricultural composition" as herein employed includes within its scope herbicidal and plant growth regulant compositions. While such compositions are frequently formulated as dry powder compositions and used in this form to dust plant foliage, more commonly they are formulated into solutions, emulsions, suspensions or dispersions for wet application to plant foliage. These liquid formulations usually contain water and more water is added thereto at the time of application in order to dilute the concentration of the active ingredient in the formulation to levels enabling the application of predetermined, controlled amounts to plant foliage. Normally, the dry powder formulations are generally non-corrosive of metal surfaces whereas depending on the specific active ingredient in an aqueous liquid formulation and the surface-active agent which may also be present in the formulation, mild to severe corrosion of metal surfaces will occur when contacted by the aqueous agricultural compositions.

Brief Summary Text (4):

The term "active agricultural ingredient" as herein employed is inclusive of any ingredient functioning as a plant phytotoxicant or as a plant growth regulant. The particular function of an active ingredient can be that of a herbicide when applied to the plant at moderate to high application rates and, on the other hand, function as a plant growth regulant at low to minute application rates. Such dual function capability is exhibited by some of the aminomethylenephosphonic acids and their agriculturally acceptable salts as described in U.S. Pat. Nos. 3,455,675 and 3,556,762, the former being directed to phytotoxicant use and the latter to plant growth regulation. The herbicidal activity of N-phosphonomethylglycine and its agriculturally acceptable salt and ester derivatives is described in U.S. Pat. Nos. 3,799,758; 3,868,407; 3,971,648 and 3,977,860. Plant growth regulant utility for N-phosphonomethylglycine and its agriculturally acceptable salt and ester derivatives is described in U.S. Pat. Nos. 3,853,530 and 3,988,142.

Brief Summary Text (5):

The aqueous formulations of the aminomethylenephosphonic acids, such as N-phosphonomethylglycine or derivatives thereof, and more particularly those formulations water-diluted to application levels are corrosive to iron, steel or galvanized metal surfaces of containers in which the concentrates or mixtures are stored, and to steel or galvanized surfaces of spraying equipment. Hydrogen evolution is one aspect of the corrosion activity and can cause disruptive pressures in closed containers containing the aqueous agricultural compositions as well as constituting a fire hazard and explosion hazard.

Brief Summary Text (8):

It was thus most surprising to discover that thiol compounds, e.g. mercaptans, as

well as the ammonium and alkali metal thio salts of inorganic polybasic acids and the thio alkali metal salts are effective inhibitors of metal corrosion for aqueous agricultural compositions containing as an active agricultural ingredient an aminomethylenephosphonic acid, such as N-phosphonomethylglycine or the agriculturally acceptable salt or ester derivatives thereof. Obviously, a satisfactory inhibitor of acidic corrosion as measured by H.sub.2 evolution and metal corrosion rate for a herbicidal composition or plant growth regulant composition should not deleteriously modify the agricultural activity of the composition. It was found that both retention of agricultural activity and adequate inhibition of acidic corrosion was obtained by the addition to aqueous formulations of an aminomethylenephosphonic acid or the agriculturally acceptable derivatives of relatively small amounts of certain thio compounds, such as the alkane thiols and dithiols, alkali metal salts of the alkane thiols and dithiols, and the ammonium and alkali metal thio salts of polybasic inorganic acids, i.e., sulfuric acid and phosphoric acid. Adequate inhibition of acidic corrosion as measured by H.sub.2 evolution can be obtained with a minimum of about 0.15 percent by weight of the thio compound on the weight of N-phosphonomethylglycine. To insure long term corrosion inhibition, it is preferred to use the thio compound in amounts of 0.3 to 3 percent by weight on the weight of the N-phosphonomethylglycine or aminomethylenephosphonic acid or derivatives thereof although the thio compound can be employed in amounts as high as 20 percent by weight based on the N-phosphonomethylglycine. Not too infrequently, aqueous concentrates of the herbicidal or plant growth regulant compositions may be stored in the vendor's metal containers by the farmer for many months before being used and, hence, it is desirable to minimize corrosion of the container to the maximum extent in order to prevent any possible leakage of the concentrate due to rusting of the container's metal walls. Amounts more than 5 percent by weight of the thio compound can be used if desired but no further commensurate advantage with respect to corrosion is usually realized.

Brief Summary Text (9):

In the agricultural formulations of this invention, one can employ anionic, cationic or non-ionic surface-active agents. The surfactants which are useful in the compositions of this invention include those of the cationic, anionic, and non-ionic variety and also amine oxide, imidazolines, propoxylated ethoxylated ethylenediamine, quaternary ammonium compounds, betaine derivatives as well as amphoteric surfactants. Examples of the amine oxides are lauryldimethylamine oxide, cetyldimethylamine oxide, myristyldimethylamine oxide, bis(2-hydroxyethyl)cocoamine oxide and the like. Examples of quaternary amine surfactants are cocotrimethylammonium chloride, alkylamidoethyl alkyl imidazolium methyl methosulfate. Examples of cationic surfactants are N,N-bis(2-hydroxyethyl)alkylamines where the alkyl groups are C.sub.14 -C.sub.18 derived from tallow, N,N-bis(.alpha.-ethyl-omega-hydroxy)-poly(oxyethylene)alkylamines having an average of 3 oxyethylene groups, the alkyl being C.sub.14 -C.sub.18 derived from tallow and (3-lauramidopropyl) trimethylammonium methyl sulfate. Some anionic surface-active agents are the sulfated fatty alcohols and the alkylarylsulfonates. Representative of the sulfated fatty alcohols are the sodium or lower alkanol amine salts of the monoesters of sulfuric acid with N-aliphatic alcohols containing from 8 to 18 carbon atoms. The alkylarylsulfonates are inclusive of the products derived from the alkylation of an aromatic hydrocarbon, e.g., benzene, naphthalene, diphenyl, diphenyl methane and phenoxybenzene, sulfonation of the resulting alkylated aromatic hydrocarbon and neutralization of the sulfonation product with NaOH or KOH, or with a primary or secondary amine.

Brief Summary Text (10):

Some non-ionic surface-active agents are the ethoxylated monoamines having the structure ##STR2## wherein R is alkyl containing from about 8 to 16 carbon atoms and m is an integer from 2 to 25. Preferred anionic surface-active agents are the aliphatic amine salts of monoalkyl (C.sub.8 -C.sub.16) phenoxybenzene disulfonic acids.

Brief Summary Text (12):

The corrosion inhibited agricultural compositions of this invention, including concentrates requiring dilution with water prior to plant application, contain from 5 to 95 parts by weight of an agriculturally active agent, from about 5 to 95 parts

by weight of an adjuvant comprising from 0.25 to 25 parts by weight of a non-ionic or anionic surface-active agent, from 0 to 25 parts by weight of a dispersant and from about 4.5 to about 95 parts by weight of inert liquid extender, e.g., water and from 0.1 to 2 parts by weight of a suitable thio compound. The compositions are prepared by admixing the active ingredient, the thio compound, the surface-active agent and the liquid extender to provide liquid compositions in the form of solutions, suspensions, dispersions or emulsions. These liquid compositions immediately prior to application to plants are diluted with water as required to obtain the desired effects (herbicidal or plant growth regulation).

Brief Summary Text (17):

Water-diluted concentrates prepared as described supra and containing the monoisopropylamine salt of N-phosphonomethylglycine as the active agricultural ingredient were modified by the inclusion of various thiol compounds and surfactants as stated in subsequent Table I. Test data reported in Table I was obtained at room temperature.

Brief Summary Text (20):

Experiment 11 involved a herbicidal formulation containing in addition to the dodecanethiol inhibitor, the copresence of oxalic acid in an amount equal to the weight of the isopropylamine salt of N-phosphonomethylglycine. The use of oxalic acid in herbicidal formulations containing N-phosphonomethylglycine or its derivatives is disclosed in "Research Disclosure" publication number RD15334, published January, 1977 by Industrial Opportunities Ltd., Homewell-Havant-Hampshire PO9 1EF, United Kingdom. According to said publication, when herbicidal formulations containing N-phosphonomethylglycine or its derivatives are diluted for application purposes with hard water, i.e. water containing calcium or magnesium ions in the range of from 100 to 2000 or more parts by weight per million parts by weight of water, the diluted formulations have diminished herbicidal activity as compared to the same formulations diluted with deionized water. The publication teaches the use of oxalic acid in hard water diluted herbicidal formulations to restore the herbicidal activity and recommends the amount of oxalic acid be at least equivalent to 50 percent of the calcium or magnesium ion to as much as 200 percent or more of such ions present in the diluting hard water. The weight ratio of the N-phosphonomethylglycine compound to oxalic acid ranges from 1 to 10 parts by weight of the glycine compound per 1 to 10 parts by weight of oxalic acid. Oxalic acid is known to be corrosive of iron surfaces. As demonstrated by the data in Table I for Experiment 11, the normal corrosive action of oxalic acid on iron surfaces is satisfactorily inhibited when a thiol compound is present in the herbicidal formulation.

Brief Summary Text (21):

That the use of thio compounds as inhibitors of metal corrosion in herbicidal compositions containing an amine salt of N-phosphonomethylglycine does not significantly diminish post-emergent herbicidal activity of the composition is quite evident from the data presented in Table II on the post-emergence killing of quackgrass using formulations described in Table I, being Experiments 1 to 6 and 16 to 18. The experimental formulations were suitably diluted with water and applied to quackgrass plants established from vegetative propagules at a rate of 187 liters per hectare. Plants treated with the experimental formulations were placed in a greenhouse as observed and recorded 12 days after treatment with the herbicidal formulation.

Brief Summary Text (22):

In order to determine that effect on post-emergence herbicidal activity would result when the quantity of thiol inhibitor in a herbicidal formulation containing the monoisopropylamine salt of N-phosphonomethylglycine as the active ingredient was increased many fold beyond that required for adequate inhibition of hydrogen evolution and metal corrosion, two control formulations were prepared, one containing previously described surfactant "A" and the other surfactant "C" according to the following formula, all parts being by weight:

Brief Summary Text (23):

The formulations were then diluted with water and sufficient additional surfactant added to the diluted formulations for the surfactant to constitute in each instance

1 percent by weight of the diluted formulation. The amount of water used to prepare the diluted formulations was so adjusted that each diluted formulation could be spray applied to the plants at a common rate of 187 liters per hectare, even though the amount of active ingredient in each diluted formulation was maintained at different levels. The amount of thiol inhibitor in each diluted formulation was also adjusted to maintain a constant application of 4.48 kilograms per hectare when the diluted formulation was spray applied at 187 liters per hectare. The diluted formulations (with and without inhibitor) were sprayed of 3 week old greenhouse grown Johnson grass and quackgrass and the observations as to herbicidal effectiveness reported in Table III were made 28 days later.

Brief Summary Text (25):

Although the inhibitor efficacy of various thio compounds was exemplified with the monoisopropylamine salt of N-phosphonomethylglycine in Table I, substantially similar corrosion inhibition can be expected when a thio compound as herein disclosed is admixed with other salts and esters of N-phosphonomethylglycine such as the alkali metal salts as are disclosed in U.S. Pat. No. 3,977,860. Such salts and esters include but are not limited to the following: monocyclohexylamine salt of N-phosphonomethylglycine di(methylamine) salt of N-phosphonomethylglycine di(dimethylamine) salt of N-phosphonomethylglycine di(ethylamine) salt of N-phosphonomethylglycine di(n-propylamine) salt of N-phosphonomethylglycine di(morpholine) salt of N-phosphonomethylglycine mono(stearlyamine) salt of N-phosphonomethylglycine mono(tallowamine) salt of N-phosphonomethylglycine mono(methylbutyl) salt of N-phosphonomethylglycine mono(butylamine) salt of N-phosphonomethylglycine n-dibutylamine salt of N-phosphonomethylglycine n-octadecylamine salt of N-phosphonomethylglycine methoxyethylamine salt of N-phosphonomethylglycine ethylenediamine salt of N-phosphonomethylglycine dipropanolamine salt of N-phosphonomethylglycine chloroethylamine salt of N-phosphonomethylglycine phenoxyethylamine salt of N-phosphonomethylglycine mono(triethylamine) salt of N-phosphonomethylglycine mono(diethylenetriamine) salt of N-phosphonomethylglycine monoisopropylamine salt of N-phosphonomethylglycine monomorpholine salt of N-phosphonomethylglycine monoaniline salt of N-phosphonomethylglycine monoethanolamine salt of N-phosphonomethylglycine monoammonium salt of N-phosphonomethylglycine monosodium salt of N-phosphonomethylglycine disodium salt of N-phosphonomethylglycine trisodium salt of N-phosphonomethylglycine monopotassium salt of N-phosphonomethylglycine dipotassium salt of N-phosphonomethylglycine tripotassium salt of N-phosphonomethylglycine dilithium salt of N-phosphonomethylglycine

Brief Summary Text (45):

Data on hydrogen evolution and corrosion inhibition by dodecanethiol for several agricultural formulations containing as an active ingredient N-phosphonomethylglycine or salt or ester derivature thereof or an aminophosphonate compound are tabulated in Table IV. The formulations used in Table IV were of two types, liquid and dry powder. Experiments 34 and 35 were conducted on liquid formulations of the following compositions, all parts being by weight:

Brief Summary Text (47):

Surfactant "C" is as previously described.

Brief Summary Text (48):

Surfactant "D", an anionic surfactant, is a complex of sodium dioctyl-sulfosuccinate.

Brief Summary Text (49):

Experiments 34, 36, 38, 40, 42 and 44 were control experiments containing no inhibitor. Experiments 37, 39, 41, 43 and 45 were dry solid formulations containing a complex of urea and dodecanethiol. Alkane thiols such as dodecanethiol are substantially water insoluble and although a surfactant is an aid in effecting dispersion of the thiol in an aqueous formulation, it has been found that a solid complex of urea and a straight chain alkane thiol when mixed with a dry mixture of the active ingredient and surfactant enhances dispersibility of the thiol in aqueous agricultural formulations and minimizes separation of the thiol component. The complex dissolves readily in water to reform the urea and the thiol with the thiol

Brief Summary Text (50) :

Brief Summary Paragraph Table (1):

Brief Summary Paragraph Table (2) :

H.sub.2 Evolution cc During Surf- Weight % Solu- Initial 24 Hours per Corrosion Rate
Expt. ac- Inhibitor tion Metal Surface (929 sq/cm) (mm/year) # tant* in
"Concentrate" Inhibitor pH Steel Zinc Steel Zinc

*Surfactant "A" is a non-ionic type surfactant comprising an ethoxylated tallow amine having the structure ##STR3## wherein m has an average value of between 15 and 20 and R is alkyl having an average number of carbon atoms of about 17-18.

Surfactant "B" is an anionic type surfactant comprising a mixture which averages about 80 percent or more by weight of a monoisopropylamine salt of C.sub.10 alkyl

- phenoxybenzene disulfonic acid and up to about 20 percent by weight of dialkylated products of phenoxybenzene disulfonic acid. ##STR4## **Weight gain.

Brief Summary Paragraph Table (3):

Table II													% Inhibition Plant Response (%)					
Quackgrass Experiment Rate 12 Days After Number													Surfactant Inhibitor (kg/h)*					
Treatment)													1 A None 1.12 95 0.56 95 0.28 40 2					
B None	1.12	99	0.56	99	0.28	50	3	C None	1.12	99	0.56	99	0.28	60	4	A Dodecane-	1.12	
98 thiol	0.56	98	0.28	45	5	B Dodecane-	1.12	99	thiol	0.56	98	0.28	70	6	C Dodecane-	1.12		
1.12	99	thiol	0.56	99	0.28	55	16	A Ammonium	1.12	99	thiosul-	fate	0.56	98	0.28	60	17	
B Ammonium	1.12	99	thiosul-	fate	0.56	90	0.28	60	18	C Ammonium	1.12	99	thiosul-	fate	0.56	99	0.28	40
													*Amount of monoisopropylamine					
salt of N-phosphonomethylglycine applied pe hectare.																		

Brief Summary Paragraph Table (4):

N-phosphonomethylglycine Surfactant 15 parts Water 44 parts

Brief Summary Paragraph Table (5):

Table III										Formulation Rate % Inhibition										
Surfactant Inhibitor (kg/h)* Johnson Grass Quackgrass																				
										A None 0.28 100 100 A None 0.14 65 98 A None										
0.07 35 25 A None 0.035 0 20 C None 0.28 95 100 C None 0.14 60 95 C None 0.07 30 35																				
C None 0.035 0 20 A Octane- 0.28 85 100 thiol A Octane- 0.14 55 65 thiol A Octane-																				
0.07 30 15 thiol A Octane- 0.035 0 0 thiol C Octane- 0.28 85 75 thiol C Octane- 0.14																				
35 45 thiol C Octane- 0.07 20 30 thiol C Octane- 0.035 0 0 thiol A 1,12-Dode- 0.28																				
90 100 canedithiol A 1,12-dode- 0.14 60 90 canedithiol A 1,12-dode- 0.07 15 25																				
canedithiol A 1,12-dode- 0.035 0 15 canedithiol C 1,12-dode- 0.28 85 100 canedithiol																				
C 1,12-dode- 0.14 35 70 canedithiol C 1,12-dode- 0.07 20 40 canedithiol C 1,12-dode-																				
0.035 0 20 canedithiol											*Amount of									
monoisopropylamine salt of N-phosphonomethylglycine applied he hectare.																				

Brief Summary Paragraph Table (6):

N-phosphonomethylglycine Surfactant "C" 15 Water 44

Brief Summary Paragraph Table (7):

N-phosphonomethylglycine Surfactant "C" 15 Dodecanethiol 1 Water 43

Brief Summary Paragraph Table (8):

methylglycine Surfactant "D" 2 Urea 20

Brief Summary Paragraph Table (9):

methylglycine Surfactant "D" 2 Dodecanethiol - 9.2 Urea Complex (2.1 parts thiol) (7.1 parts urea) Urea 10.9

Brief Summary Paragraph Table (10):

methylglycine Surfactant "D" 2 Urea 23.4

Brief Summary Paragraph Table (11):

methylglycine Surfactant "D" 2 Dodecanethiol 9.2 Urea Complex (2.1 parts thiol) (7.1

parts urea) Urea 14.3 _____

Brief Summary Paragraph Table (12):

_____ Experiment 40
 _____ Dipotassium salt of N-phosphono- 89.7
 methylglycine Surfactant "D" 2 Urea 8.3 _____

Brief Summary Paragraph Table (13):

_____ Experiment 41
 _____ Dipotassium salt of N-phosphono- 87.7
 methylglycine Surfactant "D" 2 Dodecanethiol - 9.2 Urea Complex (2.1 parts thiol)
 (7.1 parts urea) Urea 1.2 _____

Brief Summary Paragraph Table (14):

_____ Experiment 42
 _____ N-phosphonomethylglycine 64.4 Surfactant "D"
 2 Urea 33.6 _____

Brief Summary Paragraph Table (15):

_____ Experiment 43
 _____ N-phosphonomethylglycine 64.4 Surfactant "D"
 2 Dodecanethiol - 9.2 Urea Complex (2.1 parts thiol) (7.1 parts urea) Urea 22.4

Brief Summary Paragraph Table (16):

_____ Experiment 44
 _____ 2,2'-bisphosphonomethylimino- 51 acetic acid
 Surfactant "D" 2 Urea 47 _____

Brief Summary Paragraph Table (17):

_____ Experiment 45
 _____ 2,2'-bisphosphonomethylimino- 51 acetic acid
 Surfactant "D" 2 Dodecanethiol - 9.2 Urea Complex (2.1 parts thiol) (7.1 parts urea)
 Urea 37.9 _____

Brief Summary Paragraph Table (18):

_____ Experiment 46
 _____ Monoethyl ester of N-phosphono- 86.3
 methylglycine Surfactant "D" 2 Urea 11.7 _____

Brief Summary Paragraph Table (20):

Table IV

H.sub.2 Evolution cc/sq.ft. Corrosion Ex. Active from Steel from Zinc Rate (mm/hr)
 No. Surfactant Ingredient Inhibitor pH 0-24 Hours 0-24 Hours Steel Zinc

_____ 34 C
 Diisopropyl- None 7.17 5.3 1.8 0.266 0.320 amine salt of N-phos- phonomethyl-
 glycine 35 C " Dodecane- 7.10 0 0 0.012 0.005 thiol 36 D Disodium None 6.54 4.99 0
 0.172 0.055 salt of N- phosphono- methylgly- cine 37 D " Dodecane- 6.79 0 0 0.017
 0.017 thiol 38 D Diammonium None 6.56 5.20 0.60 0.132 0.045 salt of N- phosphono-
 methylgly- cine 39 D " Dodecane- 6.60 0 0 0.010 0.010 thiol 40 D Dipotassium None
 6.70 6.19 0.8 0.0812 0.035 salt of N- phosphono- methylgly- cine 41 D Dipotassium
 Dodecane- 6.79 0 0 0.007 0.002 salt of N- thiol phosphono- methylgly- cine 42 D
 N-phosphono- None 2.17 4.3 89.9 0.010 2.029 methylgly- cine 43 D " Dodecane- 2.14 0
 0.8 0.003 0.187 thiol 44 D 2,2'-bis- None -- 233 720 6.45 23.3 phosphono-
 methylimino- acetic acid 45 D " Dodecane- -- 0 2.9 0.030 0.038 thiol 46 D Monoethyl
 None -- 0.6 0.5 0.040 0.063 ester of N- phosphono- methylgly- cine 47 D " Dodecane-
 -- 0 0 0.020 0.030 thiol

Current US Original Classification (1):

504/206

CLAIMS:

1. A herbicidal or plant growth regulant composition comprising an active ingredient

selected from the aminomethylenephosphonic acids of the formula ##STR5## wherein y and z are each individually 1 or 2, and x is 0 or 1, the sum of x, y and z being 3, and the agriculturally acceptable salts and esters thereof, at least one of water or a surfactant, and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

8. A composition according to claim 1 containing, in addition, between 1 and 10 parts by weight of oxalic acid per 1 to 10 parts by weight of an amine salt of N-phosphonomethylglycine.

10. An composition according to claim 1 wherein the active ingredient is N-phosphonomethylglycine.

12. An composition according to claim 1 wherein the active ingredient is a salt of N-phosphonomethylglycine.

13. An composition according to claim 12 wherein the salt is the monoisopropylamine salt of N-phosphonomethylglycine.

14. A method for inhibiting corrosion of iron and zinc metal surfaces in contact with an aqueous herbicidal and plant growth regulant composition comprising water, a surfactant and an active ingredient selected from the aminomethylenephosphonic acids of the formula ##STR6## wherein y and z are each individually 1 or 2, and x is 0 or 1, the sum of x, y and z being 3, and the agriculturally acceptable salts and esters thereof which comprises adding to the composition an inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

20. A method in accordance with claim 14 wherein the thiol is an alkane thiol complexed with urea and the urea-thiol complex is admixed with a dry mixture of the active ingredient and the surfactant before dispersing in water.

21. A method which comprises contacting a plant with a phytotoxic amount of an aqueous herbicidal composition comprising an amine salt of N-phosphonomethylglycine, a surfactant and a metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

22. A method according to claim 21 wherein the thio compound constitutes between 0.15 and 3 percent by weight of the amine salt of N-phosphonomethylglycine.

23. A method according to claim 21 wherein the amine salt is the monoisopropylamine salt of N-phosphonomethylglycine.

24. A method which comprises contacting a plant with a plant growth regulating amount of an aqueous plant growth regulating composition comprising a compound selected from the aminomethylenephosphonic acids having the formula ##STR7## wherein y and z are each individually 1 or 2, and x is 0 or 1, the sum of x, y and z being 3, and the agriculturally acceptable salts and esters thereof, a surfactant, and metal corrosion inhibiting amount of a thio compound selected from alkane thiols having from 2 to 16 carbon atoms in the alkane moiety, aromatic thiols, the alkali metal salts of said thiols and the ammonium and alkali metal thio salts of polybasic inorganic acids.

Print

☐ 1. Document ID: US 20030100449 A1

May 29, 2003

NAME	CITY	STATE	COUNTRY	RULE-47
Maeda, Masaru	Kusatsu-shi		JP	
Shimizu, Manabu	Kusatsu-shi		JP	

US-CL-CURRENT: 504/127; 504/136

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

☐ 2. Document ID: US 20030096708 A1

May 22, 2003

NAME	CITY	STATE	COUNTRY	RULE-47
Agbaje, Henry E.	St. Louis	MO	US	
Becher, David Z.	St. Louis	MO	US	
Bates, Chris	Ballwin	MO	US	
Seifert-Higgins, Simone	Pacific	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	

US-CL-CURRENT: 504/365

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KM/C
Draw Desc	Image									

☐ 3. Document ID: US 20030050326 A1

L10: Entry 3 of 13

File: PGPB

Mar 13, 2003

PGPUB-DOCUMENT-NUMBER: 20030050326

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030050326 A1

TITLE: Use of neonicotinoids in pest control

PUBLICATION-DATE: March 13, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lee, Bruce	Bad Krozingen		DE	
Sutter, Marius	Binningen		CH	
Buholzer, Hubert	Binningen		CH	

US-CL-CURRENT: 514/341

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 4. Document ID: US 20020115566 A1

L10: Entry 4 of 13

File: PGPB

Aug 22, 2002

PGPUB-DOCUMENT-NUMBER: 20020115566

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020115566 A1

TITLE: Halogenated calixpyrroles, calixpyridinopyrroles and calixpyridines, and uses thereof

PUBLICATION-DATE: August 22, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Sessler, Jonathan L.	Austin	TX	US	
Marquez, Manuel	Lincolnshire	IL	US	
Anzenbacher, Pavel JR.	Bowling Green	OH	US	
Shriver, James A.	Austin	TX	US	

US-CL-CURRENT: 504/218; 540/472

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 5. Document ID: US 20010051591 A1

L10: Entry 5 of 13

File: PGPB

Dec 13, 2001

PGPUB-DOCUMENT-NUMBER: 20010051591
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20010051591 A1

TITLE: Safening crops from the phytotoxic effects of herbicidally active
N-phosphonomethyl-glycines

PUBLICATION-DATE: December 13, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Ferrett, Richard E.	St. Joseph	IL	US	
Keifer, David W.	Skillman	NJ	US	

US-CL-CURRENT: 504/103; 504/116.1, 504/126, 504/127

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMOC
Draw Desc	Image									

☐ 6. Document ID: US 6486157 B1

L10: Entry 6 of 13

File: USPT

Nov 26, 2002

US-PAT-NO: 6486157
DOCUMENT-IDENTIFIER: US 6486157 B1

TITLE: Use of insecticides in pest control

DATE-ISSUED: November 26, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lee; Bruce	Bad Krozingen			DE

US-CL-CURRENT: 514/242

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMOC
Draw Desc	Image									

☐ 7. Document ID: US 6121195 A

L10: Entry 7 of 13

File: USPT

Sep 19, 2000

US-PAT-NO: 6121195
DOCUMENT-IDENTIFIER: US 6121195 A

TITLE: Methods and compositions for enhancing formyltetrahydropteroylpolyglutamate
in plants

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nonomura; Arthur M.	Boxborough	MA	01719	
Nishio; John N.	Laramie	WY	82070	
Benson; Andrew A.	La Jolla	CA	92037	

US-CL-CURRENT: 504/136; 504/143, 504/144, 504/147, 504/149, 504/241, 504/318,
504/324, 504/339

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 8. Document ID: US 6083875 A

L10: Entry 8 of 13

File: USPT

Jul 4, 2000

US-PAT-NO: 6083875

DOCUMENT-IDENTIFIER: US 6083875 A

**** See image for Certificate of Correction ****

TITLE: Solid glyphosate formulations

DATE-ISSUED: July 4, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sato; Tatsuo	Tokyo			JP
Kuchikata; Masuo	Ryugasaki			JP
Toussaint; Marc Emile	Corroy-le-Grand			BE

US-CL-CURRENT: 504/127

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 9. Document ID: US 5846908 A

L10: Entry 9 of 13

File: USPT

Dec 8, 1998

US-PAT-NO: 5846908

DOCUMENT-IDENTIFIER: US 5846908 A

TITLE: Methods and compositions for enhancing plant growth with p-amino- or p-nitro-benzoic acids

DATE-ISSUED: December 8, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nonomura; Arthur M.	Boxborough	MA	01719	
Nishio; John N.	Laramie	WY	82070	
Benson; Andrew A.	La Jolla	CA	92037	

US-CL-CURRENT: 504/322; 504/136, 504/142, 504/144, 504/147, 504/149, 504/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 10. Document ID: US 5575993 A

L10: Entry 10 of 13

File: USPT

Nov 19, 1996

US-PAT-NO: 5575993

DOCUMENT-IDENTIFIER: US 5575993 A

**** See image for Certificate of Correction ****

TITLE: Ionene polymers containing biologically-active anions

DATE-ISSUED: November 19, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ward; James A.	Eads	TN		
Del Corral; Fernando	Memphis	TN		

US-CL-CURRENT: 424/78.1; 252/301.35, 252/405, 422/154, 422/155, 422/156, 422/158,
422/159, 422/16, 422/160, 422/6, 422/7, 424/405, 424/78.13, 424/78.14, 424/78.15,
424/78.3, 424/78.37, 424/78.38, 43/132.1, 504/345, 510/131, 510/234, 510/382,
510/383, 510/384, 510/391, 510/475, 514/252.11, 514/316, 514/332, 514/352, 514/357,
514/396, 514/399, 514/400, 514/406, 514/408, 514/422, 514/424, 514/425, 514/426,
514/428, 514/588, 514/595, 514/596, 514/597, 514/598, 514/642, 514/643, 71/27, 71/30

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☒ 13. Document ID: SU 1665561 A1

L10: Entry 13 of 13

File: DWPI

Oct 20, 1995

DERWENT-ACC-NO: 1996-266902

DERWENT-WEEK: 199627

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TITLE: Herbicide compsn. - contains amine salt of alkyl(naphthalene) sulphate and mono:ethanolamine salt of N,N-tetra:methyl:methylene:di:amine oxalate as surfactants

INVENTOR: DAVYDOV, A M; ESTRINA G YA, ; KASHIN, A A

PRIORITY-DATA: 1988SU-4636272 (December 12, 1988)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 1665561 A1	October 20, 1995		007	A01N025/22

INT-CL (IPC): A01 N 25/22

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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L10: Entry 13 of 13

File: DWPI

Oct 20, 1995

DERWENT-ACC-NO: 1996-266902

DERWENT-WEEK: 199627

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TITLE: Herbicide compsn. - contains amine salt of alkyl(naphthalene) sulphate and mono:ethanolamine salt of N,N-tetra:methyl:methylene:di:amine oxalate as surfactants

INVENTOR: DAVYDOV, A M; ESTRINA G YA, ; KASHIN, A A

PATENT-ASSIGNEE: HERBICIDES PLANT GROWTH REGULATORS RES (HERBR)

PRIORITY-DATA: 1988SU-4636272 (December 12, 1988)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
SU 1665561 A1	October 20, 1995		007	A01N025/22

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
SU 1665561A1	December 12, 1988	1988SU-4636272	

INT-CL (IPC): A01 N 25/22

ABSTRACTED-PUB-NO: SU 1665561A

BASIC-ABSTRACT:

The amine salt of alkylsulphate or alkyl naphthalenesulphonate (I) and monoethanolamine of N,N-tetramethylmethylenediamine oxalate (II) are used as surfactants in a herbicidal compsn. The mixt. contains (wt.%): amine salt of N-phosphonomethylglycine 10.85-28.06, amine salt of 2,4-dichlorophenoxyacetic acid 19.77-32.53, (I) 6-30, (II) 20-35 and water the rest.

ADVANTAGE - The compsn. has increased mechanical strength of the protective layer.

ABSTRACTED-PUB-NO: SU 1665561A

EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.0/0

DERWENT-CLASS: C01 C03

CPI-CODES: C05-B01P; C10-C03; C14-V01;